

# Instrumxx Industries

Manufacturer & Exporters



**Instrum**   
**XTRA QUALITY - XTRA ENDURANCE**



# COMPANY PROFILE

Instrumxx Industries, established in the year 2021, is an ISO certified company. A quality manufacturer of fittings, valves, condensate pots, air headers and allied instrumentation hardware products under the brand name 'IXX'. As we say 'Xtra Quality Xtra Endurance', IXX provides an unmatched advantage of being one point procurement destination for instrumentation products.

IXX's internal quality control team applies profound stage wise inspection from raw material to final stage, every unit manufactured at IXX passes through stringent technical and quality parameters.

Instrumxx Industries is fully equipped to deliver sizeable orders at short notice. It acknowledges the relevance of constant up-gradation and is a keen innovator and applicator of new technologies from time to time.

## Product Range :

- Tube Fittings – Double Ferrule Compression Fittings
- Pipe Fittings – Precision Pipe Fittings, High Pressure Forged Pipe Fittings.
- Instrument Valves – Needle Valves, Ball Valves, Manifold Valves, Gauge Valves, Globe Valves, Gate Valves and Non Return Valve.
- Instrument Accessories – Condensate Pots, Air Headers, Syphons, Snubbers, Bleed Valves, Flanges and Oval Flanges.
- Tubes & Pipes – Stainless Steel Seamless Tubes.  
Soft Annealed Copper Tubes (Bare / PVC Coated).  
Carbon Steel & Alloy Steel Seamless Pipes.  
\* Imported Monel, Inconel & Hastelloy Pipes and Tubes also available.

## Certifications :

- ISO 9001:2015.
- Type Test Certificate as per ASTM F1387 for Double Ferrule Compression Tube Fittings certified by DNV.
- Type Test Certificate as per MSS SP 099 for Valves certified by DNV.
- WPS & PQRS Certification certified by TUV Rheinland.
- MSME & NSIC

## In-House Testing Facility :

- Hydrostatic Test Bench upto 40,000 PSI
- Pneumatic Test Bench upto 1400 PSI
- Impulse Test Bench 0 - 7500 PSI
- Vibration Test
- Rotary Flexure
- Vacuum Test
- Thermal Cycling
- Salt Spray Test
- Flexure Fatigue Test
- Dye Penetrate Test as per ASME Sec V article 6
- Ultrasonic Test as per ASME Sec V article 4
- High Temperature Furnace upto 320°C



# TECHNICAL INFORMATION

## TUBE FITTING-DOUBLE COMPRESSION

|                              |  |
|------------------------------|--|
| <b>Size</b>                  | : Fractional - 1/16" to 2" and Metric - 3mm to 38mm  |
| <b>End Connection</b>        | : OD Tube, NPT, BSP, BSPT.   |
| <b>Material</b>              | : SS 316, SS316L, SS304, SS304L, CS, Brass, Monel, Inconel & Haste-Alloy   |
| <b>Thread Specifications</b> | : – American National Pipe Thread - (NPT), as per ANSI B1.20.1<br>– British Standard Pipe Taper Thread - (BSPT), as per BS21, ISO 7/1<br>– British Standard Pipe Thread - (BSPP), as per BS2779, ISO 228/1<br>– Metric, as per ISO 261, ANSI B1.13M<br>– Unified National Pipe Thread - (UN/UNF [SAE]), as per ANSI B1.1 |
| <b>Testing</b>               | : – All fittings are tested as per relevant standards  |
| <b>Temperature Range</b>     | : – -20°C to 100°C   |

### Specifications to which the fittings perform

#### – Proof Pressure Test

Test assemblies to be subjected to a pressure of 1.5 times the maximum working pressure of the Fittings applied at the rate of 200 kg/cm<sup>2</sup> per minute and maintained at final pressure for five minutes without leak.

#### – Dismantling And Reassembly Test

Test assemblies successfully completing the Proof Pressure Test above are dis-assembled and assembled twenty five times after which they must pass the Proof Pressure Test.

#### – Minimum Hydraulic Burst Pressure

Apply hydraulic pressure to the test assembly upto a maximum of four times the working pressure at the rate not exceeding 200kg/cm<sup>2</sup> per minute and maintain for five minutes without leak.

#### – Minimum Static Vacuum Test

Test assemblies satisfactorily Proof Pressure Tested are subjected to negative pressure upto 700 mbar and then isolated from the vacuum pump. The assembly must maintain the vacuum for fifteen minutes. The assemblies are suitably decreased before the test and total exhausted volume should not exceed 20% of the total assembly volume. This test can also be given at two temperature for cryogenic applications.

#### – Hydraulic Impulse Vibration Test

Test assemblies suitably Proof Pressure Tested are connected to a hydraulic pressure impulse and vibration test bench and subjected simultaneously to pressure impulses at 30 to 100 cycles per minute and vibration in two mutually perpendicular planes at 1,300 to 2,820 cycles per minute for a minimum of 5 x10<sup>5</sup> pressure impulses and 20 x10<sup>5</sup> vibration cycles. The only permissible re-tightening is allowed after the first 1,000 pressure impulses to allow for bedding-in. When subjected to the test described this coupling should not leak in the assembly. Couplings that fail shall be examined for signs of cracking due to fatigue stress.

The above tests have been specified in the standards BS 4368 Part IV:1984. Customers working with high temperatures have specified a temperature cycling test which requires test assemblies to be subjected to suitable temperature cycles and then subjected to the Proof Pressure Test without leakage. Other customers working with gases have specified a helium leak test with leak rates not exceeding 2 x10<sup>-6</sup> STD. CC/SEC.

### Tube Selection :

The following variables should be considered when ordering tubing for use with tube fittings :

- Surface Finish
- Material of construction
- Hardness
- Wall thickness



**Table - 1 STAINLESS STEEL TUBING (ASTM A269 TP316 / TP304)**

Annealed 304 or 316 stainless steel tubing ASTM A269 or equivalent. Based on ultimate tensile strength 75,000 psi (5167 bar). For metal temperature from -20° to 100°F (-29° to 37°C). Allowable working pressure loads calculated from S values of 20 000 psi (1378 bar) as specified by ANSI B31.3 code.

| Tube OD (in) | Tube Wall Thickness (in.) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|--------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|              | 0.010                     | 0.012 | 0.014 | 0.016 | 0.020 | 0.028 | 0.035 | 0.049 | 0.065 | 0.083 | 0.095 | 0.109 | 0.120 | 0.134 | 0.156 | 0.188 |
| 1/16         | 5600                      | 6800  | 8100  | 9400  | 12000 |       |       |       |       |       |       |       |       |       |       |       |
| 1/8          |                           |       |       |       |       | 8500  | 10900 |       |       |       |       |       |       |       |       |       |
| 3/16         |                           |       |       |       |       | 5400  | 7000  | 10200 |       |       |       |       |       |       |       |       |
| 1/4          |                           |       |       |       |       | 4000  | 5100  | 7500  | 10200 |       |       |       |       |       |       |       |
| 5/16         |                           |       |       |       |       |       | 4000  | 5800  | 8000  |       |       |       |       |       |       |       |
| 3/8          |                           |       |       |       |       |       | 3300  | 4800  | 6500  |       |       |       |       |       |       |       |
| 1/2          |                           |       |       |       |       |       | 2600  | 3700  | 5100  | 6700  |       |       |       |       |       |       |
| 5/8          |                           |       |       |       |       |       |       | 2900  | 4000  | 5200  | 6000  |       |       |       |       |       |
| 3/4          |                           |       |       |       |       |       |       | 2400  | 3300  | 4200  | 4900  | 5800  |       |       |       |       |
| 7/8          |                           |       |       |       |       |       |       | 2000  | 2800  | 3600  | 4200  | 4800  |       |       |       |       |
| 1            |                           |       |       |       |       |       |       |       | 2400  | 3100  | 3600  | 4200  | 4700  |       |       |       |
| 1-1/4        |                           |       |       |       |       |       |       |       |       | 2400  | 2800  | 3300  | 3600  | 4100  | 4900  |       |
| 1-1/2        |                           |       |       |       |       |       |       |       |       |       | 2300  | 2700  | 3000  | 3400  | 4000  | 4900  |
| 2            |                           |       |       |       |       |       |       |       |       |       |       | 2000  | 2200  | 2500  | 2900  | 3600  |

**Working Pressure (PSI) Note :** For gas service, use tubing where working pressure is listed outside of the shaded area (see `Tubing for Gas Services below this table-2)

- Note :1. No allowance is made for corrosion or erosion.
- 2. Calculations based on minimum wall and maximum OD allowable under ASTM A269 specification.
- 3. For welded and drawn tubing, a derating factor must be applied for weld integrity

**Suggested ordering information :**

Fully annealed high quality (Type 304, 316 etc.) (Seamless or welded and drawn) stainless steel hydraulic tubing ASTM A269 or A213, or equivalent. Hardness 80 HRB or less. Tubing is to be free of scratches and suitable for bending and flaring.

**Table - 2 TUBING FOR GAS SERVICE**  
Note : For the greatest safety factor against surface defects in any gas systems, use wall thickness no less than the following

| Metric sizes, in millimetres |                                |         |                                | Metric sizes, in millimetres |                                |         |                                |
|------------------------------|--------------------------------|---------|--------------------------------|------------------------------|--------------------------------|---------|--------------------------------|
| Tube OD                      | Minimum Nominal wall thickness | Tube OD | Minimum Nominal wall thickness | Tube OD                      | Minimum Nominal wall thickness | Tube OD | Minimum Nominal wall thickness |
| 1/8                          | 0.028                          | 3/4     | 0.065                          | 3                            | 0.8                            | 18      | 1.5                            |
| 3/16                         | 0.028                          | 7/8     | 0.083                          | 6                            | 0.8                            | 20      | 1.8                            |
| 1/4                          | 0.028                          | 1       | 0.083                          | 8                            | 1.0                            | 22      | 2.0                            |
| 5/16                         | 0.035                          | 1-1/4   | 0.109                          | 10                           | 1.0                            | 25      | 2.2                            |
| 3/8                          | 0.035                          | 1-1/2   | 0.134                          | 12                           | 1.0                            | 28      | 2.5                            |
| 1/2                          | 0.049                          | 2       | 0.180                          | 14                           | 1.2                            | 30      | 3.0                            |
| 5/8                          | 0.065                          | ----    | ----                           | 15                           | 1.5                            | 32      | 3.0                            |
|                              |                                |         | 16                             | 1.5                          | 38                             | 3.5     |                                |

**Table - 3 COPPER TUBING (ASTM B75)**

Based on ultimate tensile strength 30 000 psi (2067 bar). For metal temperatures -20° to 100°F (-29° to 37°C). Allowable working pressure loads calculated from S values of 6000 psi (413 bar) as specified by ANSI B31.3 code.

| Tube OD (in) | Tube Wall Thickness (in.) |       |       |       |       |       |       |       |
|--------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|
|              | 0.028                     | 0.035 | 0.049 | 0.065 | 0.083 | 0.095 | 0.109 | 0.120 |
| 1/8          | 2700                      | 3600  |       |       |       |       |       |       |
| 3/16         | 1800                      | 2300  | 3400  |       |       |       |       |       |
| 1/4          | 1300                      | 1600  | 2500  | 3500  |       |       |       |       |
| 5/16         |                           | 1300  | 1900  | 2700  |       |       |       |       |
| 3/8          |                           | 1000  | 1600  | 2200  |       |       |       |       |
| 1/2          |                           | 800   | 1100  | 1600  | 2100  |       |       |       |
| 5/8          |                           |       | 900   | 1200  | 1600  | 1900  |       |       |
| 3/4          |                           |       | 700   | 1000  | 1300  | 1500  | 1800  |       |
| 7/8          |                           |       | 600   | 800   | 1100  | 1300  | 1500  |       |
| 1            |                           |       | 500   | 700   | 900   | 1100  | 1300  | 1500  |

**Working Pressure (PSI) Note :** For gas service, use tubing where working pressure is listed outside of the shaded area (see `Tubing for Gas Services above this table-2)

- Note :1. No allowance is made for corrosion or erosion.
- 2. Calculations based on minimum wall and maximum OD allowable under ASTM B75 specification.

**Suggested ordering information :**

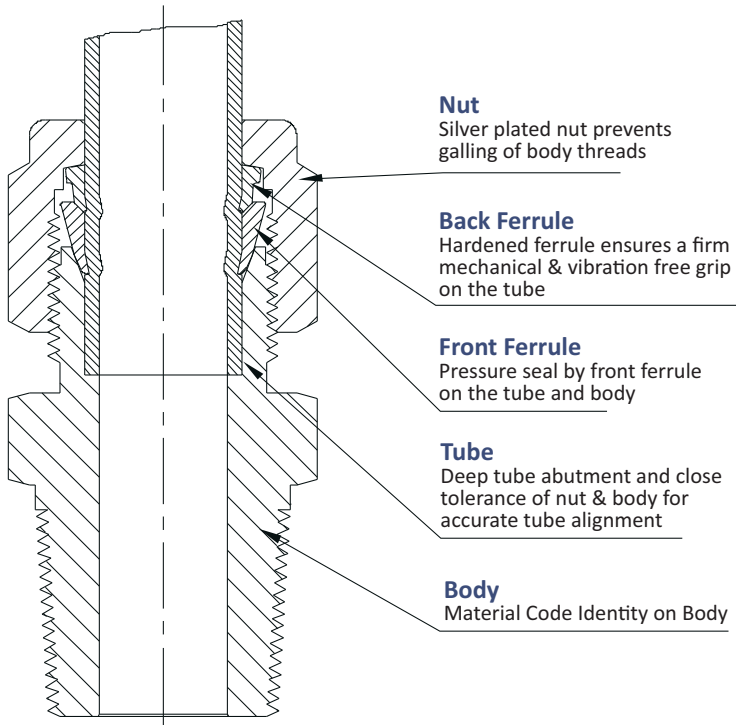
High quality soft annealed seamless copper tubing ASTM B75 or equivalent. Also soft annealed (temper 0) copper water tube type K or type L to ASTM B88.



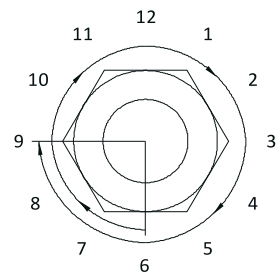
# ASSEMBLY

IXX Tube Fittings are used for leak proof, torque-free seal in different instrumentation & process tubing connection.

Consisting of four parts i.e., a Nut, Back Ferrule, Front Ferrule and Body, the Tube Fitting Assembly & Pre-Swaging technique is as follows.

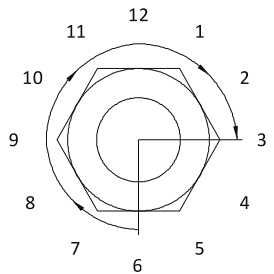


1-1/4 turn  
From the marked position



1/4" to 1"  
6 – 25 mm

3/4 turn  
From the marked position



1/16" to 3/16"  
2 – 4 mm

## Swaging Process :

Tube Fittings assembly are installed in three easy steps.

STEP – 1 Insert the Tubing into the Tube Fitting Body, make sure that the Tubing rests firmly on the shoulders of the Fitting and that the nut is snug tight, in this position the Tube does not rotate by hand.

STEP – 2 Before tightening the Nut, scribe the Nut at the 6. O'clock position.

STEP – 3 Now while holding the Fitting Body steady with a backup wrench, tighten the Nut \*1-1/4 turns.

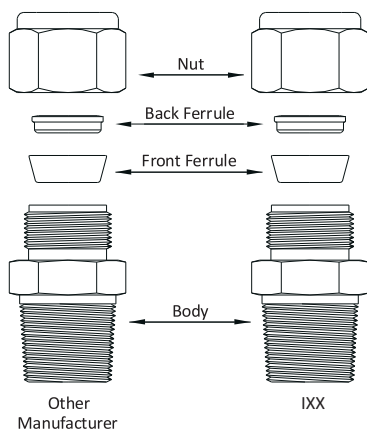
Watch the scribe mark, make one complete revolution and continue to the 9. O'clock position.

\*For 1/8" and 3/16" size Tube Fittings, only 3/4 turns from finger-tight is required.

Reassembly Instructions- Insert tube into the Fitting Body and hand tighten. Using wrench, rotate the Nut approximately 1/4 turn to original 1-1/4 turns position. Then snug slightly with wrench.

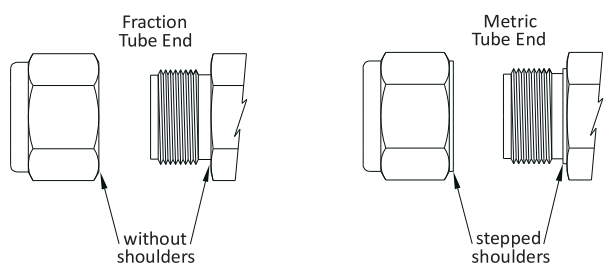
## Inter-Changeability

The Design of IXX Tube Fittings are similar to certain other well-known International Fitting manufacturers IXX guarantees the functional interchange-ability without disturbing the performance and reliability.



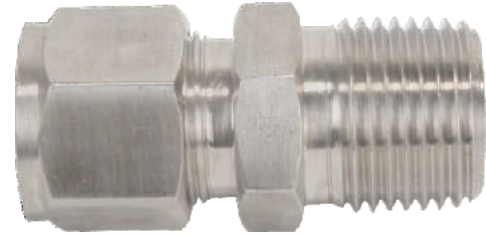
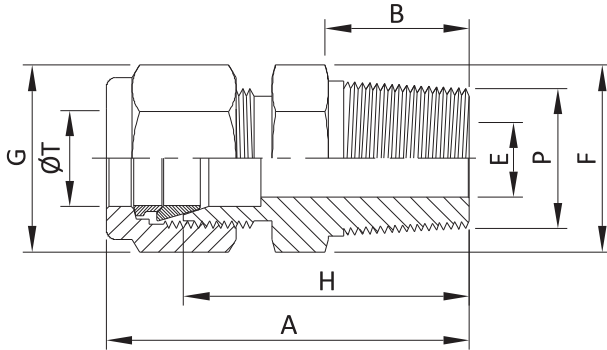
## Identification of Metric Twin Ferrule Tube Fittings from fraction

These two are similar in appearance. To avoid any confusion and for ready identification, the stepped shoulders are machined on the body and on the hex nut of metric size Tube Fittings as shown.



# DOUBLE COMPRESSION TUBE FITTINGS

## MALE CONNECTOR



### (INCH OD Tubes x Male NPT)

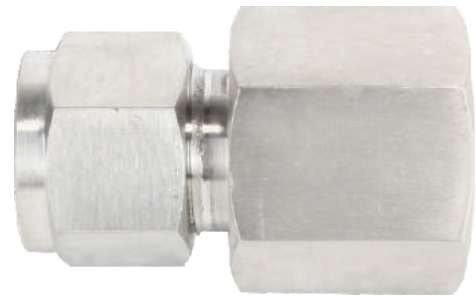
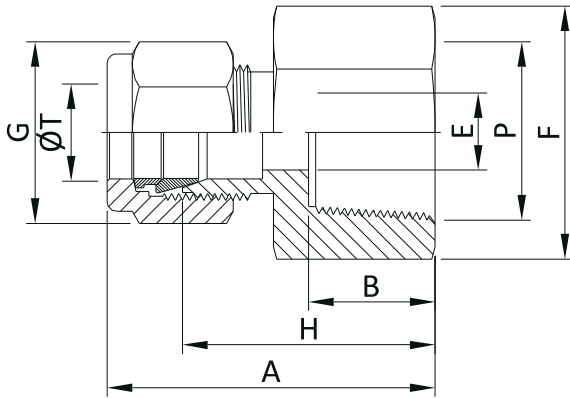
| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A     | B    | ØE   | F<br>A/F | G<br>A/F | H    |
|------------------------------|-------------------------|--------------------------|-------|------|------|----------|----------|------|
|                              | T<br>Tube<br>OD<br>(in) | P<br>NPT<br>Male<br>(in) |       |      |      |          |          |      |
| IXX-MC-1-1N                  | 1/16                    | 1/16                     | 23.9  | 9.6  | 1.3  | 8.0      | 8.0      | 20.0 |
| IXX-MC-1-2N                  | 1/16                    | 1/8                      | 26.2  | 9.6  | 1.3  | 14.0     | 8.0      | 22.4 |
| IXX-MC-2-2N                  | 1/8                     | 1/8                      | 30.5  | 9.6  | 2.4  | 11.0     | 11.0     | 23.9 |
| IXX-MC-2-4N                  | 1/8                     | 1/4                      | 35.6  | 14.3 | 2.4  | 14.0     | 11.0     | 29.0 |
| IXX-MC-4-2N                  | 1/4                     | 1/8                      | 32.8  | 9.6  | 4.8  | 14.0     | 14.0     | 25.4 |
| IXX-MC-4-4N                  | 1/4                     | 1/4                      | 37.8  | 14.3 | 4.8  | 14.0     | 14.0     | 30.5 |
| IXX-MC-4-6N                  | 1/4                     | 3/8                      | 38.4  | 14.3 | 4.8  | 19.0     | 14.0     | 31.0 |
| IXX-MC-4-8N                  | 1/4                     | 1/2                      | 44.7  | 19.1 | 4.8  | 22.0     | 14.0     | 37.4 |
| IXX-MC-5-4N                  | 5/16                    | 1/4                      | 38.6  | 14.3 | 6.3  | 14.0     | 16.0     | 31.2 |
| IXX-MC-6-2N                  | 3/8                     | 1/8                      | 35.3  | 9.6  | 4.8  | 16.0     | 17.0     | 27.9 |
| IXX-MC-6-4N                  | 3/8                     | 1/4                      | 39.8  | 14.3 | 7.1  | 16.0     | 17.0     | 32.5 |
| IXX-MC-6-6N                  | 3/8                     | 3/8                      | 39.8  | 14.3 | 7.1  | 19.0     | 17.0     | 32.5 |
| IXX-MC-6-8N                  | 3/8                     | 1/2                      | 41.2  | 19.1 | 7.1  | 22.0     | 17.0     | 38.9 |
| IXX-MC-8-4N                  | 1/2                     | 1/4                      | 43.4  | 14.3 | 7.1  | 22.0     | 22.0     | 33.3 |
| IXX-MC-8-6N                  | 1/2                     | 3/8                      | 43.4  | 14.3 | 9.6  | 22.0     | 22.0     | 33.3 |
| IXX-MC-8-8N                  | 1/2                     | 1/2                      | 49.0  | 19.1 | 10.4 | 22.0     | 22.0     | 38.9 |
| IXX-MC-8-12N                 | 1/2                     | 3/4                      | 50.5  | 19.1 | 10.4 | 27.0     | 22.0     | 40.4 |
| IXX-MC-8-16N                 | 1/2                     | 1                        | 57.1  | 23.8 | 10.4 | 35.0     | 22.0     | 47.0 |
| IXX-MC-10-6N                 | 5/8                     | 3/8                      | 44.2  | 14.3 | 9.6  | 24.0     | 25.0     | 34.0 |
| IXX-MC-10-8N                 | 5/8                     | 1/2                      | 49.0  | 19.1 | 10.4 | 24.0     | 25.0     | 38.9 |
| IXX-MC-12-8N                 | 3/4                     | 1/2                      | 50.5  | 19.1 | 10.4 | 27.0     | 28.5     | 40.4 |
| IXX-MC-12-12N                | 3/4                     | 3/4                      | 50.5  | 19.1 | 15.8 | 27.0     | 28.5     | 40.4 |
| IXX-MC-12-16N                | 3/4                     | 1                        | 57.1  | 23.8 | 15.8 | 35.0     | 28.5     | 47.0 |
| IXX-MC-14-12N                | 7/8                     | 3/4                      | 50.5  | 19.1 | 15.8 | 30.0     | 32.0     | 40.4 |
| IXX-MC-16-8N                 | 1                       | 1/2                      | 57.4  | 19.1 | 10.4 | 35.0     | 38.0     | 45.2 |
| IXX-MC-16-12N                | 1                       | 3/4                      | 57.4  | 19.1 | 15.8 | 35.0     | 38.0     | 45.2 |
| IXX-MC-16-16N                | 1                       | 1                        | 62.2  | 23.8 | 22.3 | 35.0     | 38.0     | 50.0 |
| IXX-MC-20-16N                | 1-1/4                   | 1                        | 77.2  | 23.8 | 22.3 | 46.0     | 50.0     | 55.2 |
| IXX-MC-20-20N                | 1-1/4                   | 1-1/4                    | 77.2  | 23.8 | 27.6 | 46.0     | 50.0     | 55.2 |
| IXX-MC-24-24N                | 1-1/2                   | 1-1/2                    | 88.9  | 26.2 | 34.0 | 55.0     | 57.0     | 61.7 |
| IXX-MC-32-32N                | 2                       | 2                        | 113.5 | 26.9 | 46.0 | 70.0     | 76.0     | 76.2 |

### (METRIC OD Tubes x Male NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A    | B    | ØE   | F<br>A/F | G<br>A/F | H    |
|------------------------------|-------------------------|--------------------------|------|------|------|----------|----------|------|
|                              | T<br>Tube<br>OD<br>(mm) | P<br>NPT<br>Male<br>(in) |      |      |      |          |          |      |
| IXX-MC-3M-2N                 | 3                       | 1/8                      | 30.5 | 9.6  | 2.4  | 11.0     | 11.0     | 23.9 |
| IXX-MC-3M-4N                 | 3                       | 1/4                      | 35.6 | 14.3 | 2.4  | 14.0     | 11.0     | 29.0 |
| IXX-MC-6M-2N                 | 6                       | 1/8                      | 32.8 | 9.6  | 4.8  | 14.0     | 14.0     | 25.4 |
| IXX-MC-6M-4N                 | 6                       | 1/4                      | 37.9 | 14.3 | 4.8  | 14.0     | 14.0     | 30.5 |
| IXX-MC-6M-6N                 | 6                       | 3/8                      | 38.4 | 14.3 | 4.8  | 19.0     | 14.0     | 31.0 |
| IXX-MC-6M-8N                 | 6                       | 1/2                      | 44.7 | 19.1 | 4.8  | 22.0     | 14.0     | 37.3 |
| IXX-MC-8M-2N                 | 8                       | 1/8                      | 34.2 | 9.6  | 4.8  | 14.0     | 16.0     | 26.7 |
| IXX-MC-8M-4N                 | 8                       | 1/4                      | 38.7 | 14.3 | 6.3  | 14.0     | 16.0     | 31.2 |
| IXX-MC-8M-6N                 | 8                       | 3/8                      | 39.3 | 14.3 | 6.3  | 19.0     | 16.0     | 31.8 |
| IXX-MC-8M-8N                 | 8                       | 1/2                      | 45.6 | 19.1 | 6.3  | 22.0     | 16.0     | 38.1 |
| IXX-MC-10M-2N                | 10                      | 1/8                      | 36.3 | 9.6  | 4.8  | 17.0     | 19.0     | 28.7 |
| IXX-MC-10M-4N                | 10                      | 1/4                      | 40.9 | 14.3 | 7.9  | 19.0     | 19.0     | 33.3 |
| IXX-MC-10M-6N                | 10                      | 3/8                      | 40.9 | 14.3 | 7.9  | 19.0     | 19.0     | 33.3 |
| IXX-MC-10M-8N                | 10                      | 1/2                      | 46.5 | 19.1 | 7.9  | 22.0     | 19.0     | 38.9 |
| IXX-MC-12M-4N                | 12                      | 1/4                      | 43.4 | 14.3 | 7.1  | 22.0     | 22.0     | 33.3 |
| IXX-MC-12M-6N                | 12                      | 3/8                      | 43.4 | 14.3 | 9.5  | 22.0     | 22.0     | 33.3 |
| IXX-MC-12M-8N                | 12                      | 1/2                      | 49.0 | 19.1 | 9.5  | 22.0     | 22.0     | 38.9 |
| IXX-MC-12M-12N               | 12                      | 3/4                      | 50.5 | 19.1 | 9.5  | 27.0     | 22.0     | 40.4 |
| IXX-MC-12M-16N               | 12                      | 1                        | 57.1 | 23.8 | 9.5  | 35.0     | 22.0     | 47.0 |
| IXX-MC-14M-4N                | 14                      | 1/4                      | 44.1 | 14.3 | 7.1  | 24.0     | 25.0     | 34.0 |
| IXX-MC-14M-6N                | 14                      | 3/8                      | 44.1 | 14.3 | 9.5  | 24.0     | 25.0     | 34.0 |
| IXX-MC-14M-8N                | 14                      | 1/2                      | 49.0 | 19.1 | 11.1 | 24.0     | 25.0     | 38.9 |
| IXX-MC-15M-8N                | 15                      | 1/2                      | 49.0 | 19.1 | 11.9 | 24.0     | 25.0     | 38.9 |
| IXX-MC-16M-6N                | 16                      | 3/8                      | 44.1 | 14.3 | 9.5  | 24.0     | 25.0     | 34.0 |
| IXX-MC-16M-8N                | 16                      | 1/2                      | 49.0 | 19.1 | 11.9 | 24.0     | 25.0     | 38.9 |
| IXX-MC-16M-12N               | 16                      | 3/4                      | 50.5 | 19.1 | 12.7 | 27.0     | 25.0     | 40.4 |
| IXX-MC-18M-8N                | 18                      | 1/2                      | 50.5 | 19.1 | 11.9 | 27.0     | 30.0     | 40.4 |
| IXX-MC-18M-12N               | 18                      | 3/4                      | 50.5 | 19.1 | 15.1 | 27.0     | 30.0     | 40.4 |
| IXX-MC-20M-8N                | 20                      | 1/2                      | 52.3 | 19.1 | 11.9 | 30.0     | 32.0     | 42.2 |
| IXX-MC-20M-12N               | 20                      | 3/4                      | 52.3 | 19.1 | 15.9 | 30.0     | 32.0     | 42.2 |
| IXX-MC-22M-12N               | 22                      | 3/4                      | 52.3 | 19.1 | 15.9 | 30.0     | 32.0     | 42.2 |
| IXX-MC-22M-16N               | 22                      | 1                        | 57.1 | 23.8 | 18.3 | 35.0     | 32.0     | 47.0 |
| IXX-MC-25M-8N                | 25                      | 1/2                      | 57.5 | 19.1 | 11.9 | 35.0     | 38.0     | 45.2 |
| IXX-MC-25M-12N               | 25                      | 3/4                      | 57.5 | 19.1 | 15.8 | 35.0     | 38.0     | 45.2 |
| IXX-MC-25M-16N               | 25                      | 1                        | 62.3 | 23.8 | 21.8 | 35.0     | 38.0     | 50.0 |
| IXX-MC-28M-16N               | 28                      | 1                        | 72.4 | 23.8 | 21.8 | 41.0     | 46.0     | 51.6 |
| IXX-MC-28M-20N               | 28                      | 1-1/4                    | 73.1 | 23.8 | 21.8 | 46.0     | 46.0     | 52.3 |
| IXX-MC-30M-20N               | 30                      | 1-1/4                    | 77.2 | 23.8 | 26.2 | 46.0     | 50.0     | 55.6 |
| IXX-MC-32M-20N               | 32                      | 1-1/4                    | 79.6 | 23.8 | 28.6 | 46.0     | 50.0     | 56.6 |
| IXX-MC-38M-24N               | 38                      | 1-1/2                    | 96.6 | 26.2 | 33.7 | 55.0     | 57.0     | 64.0 |



# FEMALE CONNECTOR



## (INCH OD Tubes x Female NPT)

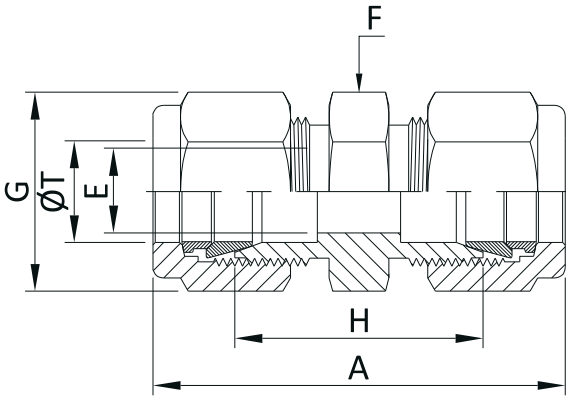
| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                            | A    | B    | ØE   | F<br>A/F | G<br>A/F | H    |
|------------------------------|-------------------------|----------------------------|------|------|------|----------|----------|------|
|                              | T<br>Tube<br>OD<br>(in) | P<br>NPT<br>Female<br>(in) |      |      |      |          |          |      |
| IXX-FC-1-1N                  | 1/16                    | 1/16                       | 23.6 | 9.9  | 1.3  | 11.0     | 8.0      | 19.8 |
| IXX-FC-1-2N                  | 1/16                    | 1/8                        | 24.4 | 10.4 | 1.3  | 14.0     | 8.0      | 20.6 |
| IXX-FC-2-2N                  | 1/8                     | 1/8                        | 28.7 | 10.4 | 2.4  | 14.0     | 11.0     | 22.1 |
| IXX-FC-2-4N                  | 1/8                     | 1/4                        | 33.6 | 15.0 | 2.4  | 19.0     | 11.0     | 26.9 |
| IXX-FC-4-2N                  | 1/4                     | 1/8                        | 31.2 | 9.9  | 4.8  | 14.0     | 14.0     | 23.9 |
| IXX-FC-4-4N                  | 1/4                     | 1/4                        | 35.8 | 15.0 | 4.8  | 19.0     | 14.0     | 28.5 |
| IXX-FC-4-6N                  | 1/4                     | 3/8                        | 37.6 | 15.0 | 4.8  | 22.0     | 14.0     | 30.2 |
| IXX-FC-4-8N                  | 1/4                     | 1/2                        | 42.4 | 19.8 | 4.8  | 27.0     | 14.0     | 35.0 |
| IXX-FC-5-2N                  | 5/16                    | 1/8                        | 32.0 | 10.4 | 6.3  | 14.0     | 16.0     | 24.6 |
| IXX-FC-5-4N                  | 5/16                    | 1/4                        | 36.8 | 15.0 | 6.3  | 19.0     | 16.0     | 29.5 |
| IXX-FC-6-2N                  | 3/8                     | 1/8                        | 32.8 | 10.4 | 7.1  | 16.0     | 17.0     | 25.4 |
| IXX-FC-6-4N                  | 3/8                     | 1/4                        | 37.6 | 15.0 | 7.1  | 19.0     | 17.0     | 30.2 |
| IXX-FC-6-6N                  | 3/8                     | 3/8                        | 39.1 | 15.0 | 7.1  | 22.0     | 17.0     | 31.8 |
| IXX-FC-6-8N                  | 3/8                     | 1/2                        | 43.9 | 19.8 | 7.1  | 27.0     | 17.0     | 36.6 |
| IXX-FC-8-4N                  | 1/2                     | 1/4                        | 40.4 | 15.0 | 10.4 | 22.0     | 22.0     | 30.2 |
| IXX-FC-8-6N                  | 1/2                     | 3/8                        | 41.9 | 15.0 | 10.4 | 22.0     | 22.0     | 30.2 |
| IXX-FC-8-8N                  | 1/2                     | 1/2                        | 46.7 | 19.8 | 10.4 | 27.0     | 22.0     | 36.6 |
| IXX-FC-8-12N                 | 1/2                     | 3/4                        | 48.3 | 20.6 | 10.4 | 32.0     | 22.0     | 38.1 |
| IXX-FC-10-6N                 | 5/8                     | 3/8                        | 41.9 | 15.0 | 12.7 | 24.0     | 25.0     | 31.8 |
| IXX-FC-10-8N                 | 5/8                     | 1/2                        | 46.7 | 19.8 | 12.7 | 27.0     | 25.0     | 36.6 |
| IXX-FC-12-8N                 | 3/4                     | 1/2                        | 46.7 | 19.8 | 15.8 | 27.0     | 28.5     | 36.6 |
| IXX-FC-12-12N                | 3/4                     | 3/4                        | 48.3 | 20.6 | 15.8 | 35.0     | 28.5     | 38.1 |
| IXX-FC-14-12N                | 7/8                     | 3/4                        | 49.8 | 20.6 | 18.3 | 35.0     | 32.0     | 39.6 |
| IXX-FC-16-12N                | 1                       | 3/4                        | 53.4 | 20.6 | 22.3 | 35.0     | 38.0     | 41.2 |
| IXX-FC-16-16N                | 1                       | 1                          | 62.3 | 25.4 | 22.3 | 41.0     | 38.0     | 50.0 |
| IXX-FC-20-20N                | 1-1/4                   | 1-1/4                      | 74.6 | 25.4 | 27.6 | 55.0     | 50.0     | 52.6 |
| IXX-FC-24-24N                | 1-1/2                   | 1-1/2                      | 83.3 | 27.6 | 34.0 | 60.0     | 60.0     | 56.2 |

## (METRIC OD Tubes x Female NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                            | A    | B    | ØE   | F<br>A/F | G<br>A/F | H    |
|------------------------------|-------------------------|----------------------------|------|------|------|----------|----------|------|
|                              | T<br>Tube<br>OD<br>(mm) | P<br>NPT<br>Female<br>(in) |      |      |      |          |          |      |
| IXX-FC-3M-2N                 | 3                       | 1/8                        | 28.7 | 10.4 | 2.4  | 14.0     | 11.0     | 22.1 |
| IXX-FC-3M-4N                 | 3                       | 1/4                        | 33.5 | 15.0 | 2.4  | 19.0     | 11.0     | 26.9 |
| IXX-FC-6M-2N                 | 6                       | 1/8                        | 31.3 | 10.4 | 4.8  | 14.0     | 14.0     | 23.9 |
| IXX-FC-6M-4N                 | 6                       | 1/4                        | 35.8 | 15.0 | 4.8  | 19.0     | 14.0     | 28.4 |
| IXX-FC-6M-6N                 | 6                       | 3/8                        | 37.6 | 15.0 | 4.8  | 22.0     | 14.0     | 30.2 |
| IXX-FC-6M-8N                 | 6                       | 1/2                        | 42.5 | 19.8 | 4.8  | 27.0     | 14.0     | 35.1 |
| IXX-FC-8M-2N                 | 8                       | 1/8                        | 32.1 | 10.4 | 6.3  | 14.0     | 16.0     | 24.6 |
| IXX-FC-8M-4N                 | 8                       | 1/4                        | 37.0 | 15.0 | 6.3  | 19.0     | 16.0     | 29.5 |
| IXX-FC-8M-6N                 | 8                       | 3/8                        | 38.5 | 15.0 | 6.3  | 22.0     | 16.0     | 31.0 |
| IXX-FC-8M-8N                 | 8                       | 1/2                        | 43.3 | 19.8 | 6.3  | 27.0     | 16.0     | 35.8 |
| IXX-FC-10M-4N                | 10                      | 1/4                        | 37.8 | 15.0 | 7.9  | 19.0     | 19.0     | 30.2 |
| IXX-FC-10M-6N                | 10                      | 3/8                        | 39.4 | 15.0 | 7.9  | 22.0     | 19.0     | 31.8 |
| IXX-FC-10M-8N                | 10                      | 1/2                        | 44.2 | 19.8 | 7.9  | 27.0     | 19.0     | 36.6 |
| IXX-FC-12M-4N                | 12                      | 1/4                        | 40.3 | 15.0 | 9.5  | 22.0     | 22.0     | 30.2 |
| IXX-FC-12M-6N                | 12                      | 3/8                        | 41.9 | 15.0 | 9.5  | 22.0     | 22.0     | 31.8 |
| IXX-FC-12M-8N                | 12                      | 1/2                        | 46.7 | 19.8 | 9.5  | 27.0     | 22.0     | 36.6 |
| IXX-FC-15M-8N                | 15                      | 1/2                        | 46.7 | 19.8 | 11.9 | 27.0     | 25.0     | 36.6 |
| IXX-FC-16M-8N                | 16                      | 1/2                        | 46.9 | 19.8 | 12.7 | 27.0     | 25.0     | 36.8 |
| IXX-FC-20M-8N                | 20                      | 1/2                        | 47.9 | 19.8 | 15.9 | 30.0     | 32.0     | 37.8 |
| IXX-FC-20M-12N               | 20                      | 3/4                        | 49.7 | 20.6 | 15.9 | 35.0     | 32.0     | 39.6 |
| IXX-FC-22M-12N               | 22                      | 3/4                        | 49.7 | 20.6 | 18.3 | 35.0     | 32.0     | 39.6 |
| IXX-FC-22M-16N               | 22                      | 1                          | 57.9 | 25.4 | 18.3 | 41.0     | 32.0     | 47.8 |
| IXX-FC-25M-12N               | 25                      | 3/4                        | 53.4 | 20.6 | 21.8 | 35.0     | 38.0     | 41.1 |
| IXX-FC-25M-16N               | 25                      | 1                          | 62.3 | 25.4 | 21.8 | 41.0     | 38.0     | 50.0 |
| IXX-FC-32M-20N               | 32                      | 1-1/4                      | 74.6 | 25.4 | 27.6 | 55.0     | 50.0     | 52.6 |
| IXX-FC-38M-24N               | 38                      | 1-1/2                      | 83.3 | 27.6 | 34.0 | 60.0     | 60.0     | 56.2 |



# UNION



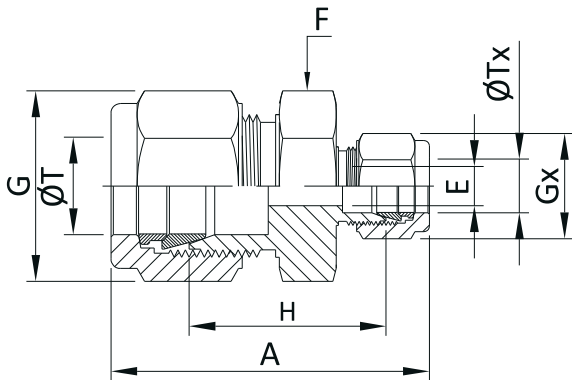
## (INCH OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               | A     | ØE   | F<br>A/F | G<br>A/F | H    |
|------------------------------|-------------------------|-------|------|----------|----------|------|
|                              | T<br>Tube<br>OD<br>(in) |       |      |          |          |      |
|                              |                         | (mm)  |      |          |          |      |
| IXX-U-1                      | 1/16                    | 25.1  | 1.3  | 8.0      | 8.0      | 17.5 |
| IXX-U-2                      | 1/8                     | 35.6  | 2.4  | 11.0     | 11.0     | 22.4 |
| IXX-U-4                      | 1/4                     | 40.9  | 4.8  | 14.0     | 14.0     | 26.2 |
| IXX-U-5                      | 5/16                    | 42.9  | 6.3  | 14.0     | 16.0     | 28.2 |
| IXX-U-6                      | 3/8                     | 45.0  | 7.1  | 16.0     | 17.0     | 30.2 |
| IXX-U-8                      | 1/2                     | 51.3  | 10.4 | 22.0     | 22.0     | 31.0 |
| IXX-U-10                     | 5/8                     | 52.0  | 12.7 | 24.0     | 25.0     | 31.8 |
| IXX-U-12                     | 3/4                     | 53.6  | 15.8 | 27.0     | 28.5     | 33.3 |
| IXX-U-14                     | 7/8                     | 55.2  | 18.2 | 30.0     | 32.0     | 34.8 |
| IXX-U-16                     | 1                       | 64.8  | 22.3 | 35.0     | 38.0     | 40.4 |
| IXX-U-20                     | 1-1/4                   | 92.2  | 27.6 | 46.0     | 50.0     | 48.0 |
| IXX-U-24                     | 1-1/2                   | 108.0 | 34.0 | 55.0     | 57.0     | 53.6 |
| IXX-U-32                     | 2                       | 149.4 | 46.0 | 70.0     | 76.0     | 74.7 |

## (METRIC OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               | A     | ØE   | F<br>A/F | G<br>A/F | H    |
|------------------------------|-------------------------|-------|------|----------|----------|------|
|                              | T<br>Tube<br>OD<br>(mm) |       |      |          |          |      |
|                              |                         | (mm)  |      |          |          |      |
| IXX-U-3M                     | 3                       | 35.3  | 2.4  | 11.0     | 11.0     | 22.1 |
| IXX-U-6M                     | 6                       | 41.0  | 4.8  | 14.0     | 14.0     | 26.2 |
| IXX-U-8M                     | 8                       | 43.2  | 6.3  | 16.0     | 16.0     | 28.2 |
| IXX-U-10M                    | 10                      | 46.2  | 7.9  | 17.0     | 19.0     | 31.0 |
| IXX-U-12M                    | 12                      | 51.2  | 9.5  | 22.0     | 22.0     | 31.0 |
| IXX-U-14M                    | 14                      | 52.0  | 11.1 | 24.0     | 25.0     | 31.0 |
| IXX-U-15M                    | 15                      | 52.0  | 11.9 | 24.0     | 25.0     | 31.8 |
| IXX-U-16M                    | 16                      | 52.0  | 12.7 | 24.0     | 25.0     | 31.8 |
| IXX-U-18M                    | 18                      | 53.5  | 15.1 | 27.0     | 30.0     | 33.3 |
| IXX-U-20M                    | 20                      | 55.0  | 15.9 | 30.0     | 32.0     | 34.8 |
| IXX-U-22M                    | 22                      | 55.0  | 18.3 | 30.0     | 32.0     | 34.8 |
| IXX-U-25M                    | 25                      | 65.0  | 21.8 | 35.0     | 38.0     | 40.4 |
| IXX-U-28M                    | 28                      | 85.0  | 21.8 | 41.0     | 46.0     | 43.4 |
| IXX-U-30M                    | 30                      | 92.7  | 26.2 | 46.0     | 50.0     | 49.5 |
| IXX-U-32M                    | 32                      | 97.3  | 28.6 | 46.0     | 50.0     | 51.3 |
| IXX-U-38M                    | 38                      | 113.6 | 33.7 | 55.0     | 57.0     | 58.4 |

# REDUCING UNION



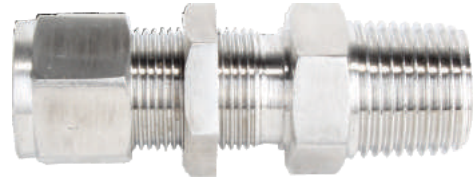
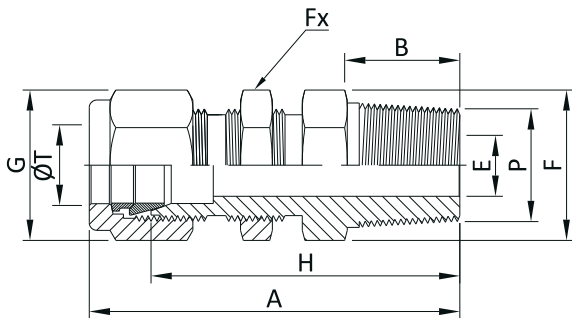
## (INCH OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A    | E    | F<br>A/F | G<br>A/F | Gx<br>A/F | H    |
|------------------------------|-------------------------|--------------------------|------|------|----------|----------|-----------|------|
|                              | T<br>Tube<br>OD<br>(in) | Tx<br>Tube<br>OD<br>(in) |      |      |          |          |           |      |
|                              | (mm)                    |                          |      |      |          |          |           |      |
| IXX-RU-4-2                   | 1/4                     | 1/8                      | 38.6 | 2.4  | 14.0     | 14.0     | 11.0      | 24.6 |
| IXX-RU-5-2                   | 5/16                    | 1/8                      | 39.6 | 2.4  | 14.0     | 16.0     | 11.0      | 25.7 |
| IXX-RU-5-4                   | 5/16                    | 1/4                      | 42.2 | 4.8  | 14.0     | 16.0     | 14.0      | 27.5 |
| IXX-RU-6-2                   | 3/8                     | 1/8                      | 40.9 | 2.4  | 16.0     | 17.0     | 11.0      | 26.9 |
| IXX-RU-6-4                   | 3/8                     | 1/4                      | 43.2 | 4.8  | 16.0     | 17.0     | 14.0      | 28.5 |
| IXX-RU-8-2                   | 1/2                     | 1/8                      | 45.2 | 2.4  | 22.0     | 22.0     | 11.0      | 28.5 |
| IXX-RU-8-4                   | 1/2                     | 1/4                      | 47.0 | 4.8  | 22.0     | 22.0     | 14.0      | 29.5 |
| IXX-RU-8-6                   | 1/2                     | 3/8                      | 48.5 | 7.1  | 22.0     | 22.0     | 17.0      | 31.0 |
| IXX-RU-10-6                  | 5/8                     | 3/8                      | 49.3 | 7.1  | 24.0     | 25.0     | 17.0      | 31.8 |
| IXX-RU-10-8                  | 5/8                     | 1/2                      | 52.0 | 10.4 | 24.0     | 25.0     | 22.0      | 31.8 |
| IXX-RU-12-4                  | 3/4                     | 1/4                      | 49.3 | 4.8  | 27.0     | 28.5     | 14.0      | 31.8 |
| IXX-RU-12-6                  | 3/4                     | 3/8                      | 50.8 | 7.1  | 27.0     | 28.5     | 17.0      | 33.3 |
| IXX-RU-12-8                  | 3/4                     | 1/2                      | 53.6 | 10.4 | 27.0     | 28.5     | 22.0      | 33.3 |
| IXX-RU-16-8                  | 1                       | 1/2                      | 60.5 | 10.4 | 35.0     | 38.0     | 22.0      | 38.1 |
| IXX-RU-16-12                 | 1                       | 3/4                      | 60.5 | 15.8 | 35.0     | 38.0     | 28.5      | 38.1 |
| IXX-RU-20-16                 | 1-1/4                   | 1                        | 92.2 | 22.3 | 45.0     | 50.0     | 38.0      | 48.0 |
| IXX-RU-24-20                 | 1-1/2                   | 1-1/4                    | 60.5 | 15.8 | 55.0     | 57.0     | 50.0      | 53.6 |

## (METRIC OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A     | ØE   | F<br>A/F | G<br>A/F | Gx<br>A/F | H    |
|------------------------------|-------------------------|--------------------------|-------|------|----------|----------|-----------|------|
|                              | T<br>Tube<br>OD<br>(mm) | Tx<br>Tube<br>OD<br>(mm) |       |      |          |          |           |      |
|                              | (mm)                    |                          |       |      |          |          |           |      |
| IXX-RU-6M-3M                 | 6                       | 3                        | 38.6  | 2.4  | 14.0     | 14.0     | 11.0      | 24.6 |
| IXX-RU-8M-6M                 | 8                       | 6                        | 42.3  | 4.8  | 14.0     | 16.0     | 14.0      | 27.4 |
| IXX-RU-10M-6M                | 10                      | 6                        | 44.5  | 4.8  | 17.0     | 19.0     | 14.0      | 29.5 |
| IXX-RU-10M-8M                | 10                      | 8                        | 45.1  | 6.3  | 17.0     | 19.0     | 16.0      | 30.0 |
| IXX-RU-12M-6M                | 12                      | 6                        | 47.0  | 4.8  | 22.0     | 22.0     | 14.0      | 29.5 |
| IXX-RU-12M-8M                | 12                      | 8                        | 47.8  | 6.4  | 22.0     | 22.0     | 16.0      | 30.2 |
| IXX-RU-12M-10M               | 12                      | 10                       | 48.7  | 7.9  | 22.0     | 22.0     | 19.0      | 31.0 |
| IXX-RU-16M-10M               | 16                      | 10                       | 49.5  | 7.9  | 24.0     | 25.0     | 19.0      | 31.8 |
| IXX-RU-16M-12M               | 16                      | 12                       | 52.0  | 9.5  | 24.0     | 25.0     | 22.0      | 31.8 |
| IXX-RU-22M-18M               | 22                      | 18                       | 55.0  | 15.1 | 30.0     | 32.0     | 30.0      | 34.8 |
| IXX-RU-22M-20M               | 22                      | 20                       | 55.0  | 15.9 | 30.0     | 32.0     | 32.0      | 34.8 |
| IXX-RU-25M-12M               | 25                      | 12                       | 65.0  | 9.5  | 35.0     | 38.0     | 22.0      | 40.4 |
| IXX-RU-25M-20M               | 25                      | 20                       | 65.0  | 15.9 | 35.0     | 38.0     | 32.0      | 40.4 |
| IXX-RU-30M-20M               | 30                      | 20                       | 75.4  | 15.9 | 45.0     | 50.0     | 32.0      | 43.7 |
| IXX-RU-30M-25M               | 30                      | 25                       | 80.1  | 21.8 | 45.0     | 50.0     | 38.0      | 46.2 |
| IXX-RU-32M-20M               | 32                      | 20                       | 77.8  | 15.9 | 45.0     | 50.0     | 32.0      | 44.7 |
| IXX-RU-32M-25M               | 32                      | 25                       | 82.3  | 21.8 | 45.0     | 50.0     | 38.0      | 47.0 |
| IXX-RU-38M-20M               | 38                      | 20                       | 92.0  | 21.8 | 55.0     | 57.0     | 38.0      | 52.1 |
| IXX-RU-38M-25M               | 38                      | 25                       | 104.6 | 26.2 | 55.0     | 57.0     | 50.0      | 55.4 |

# BULKHEAD MALE CONNECTOR



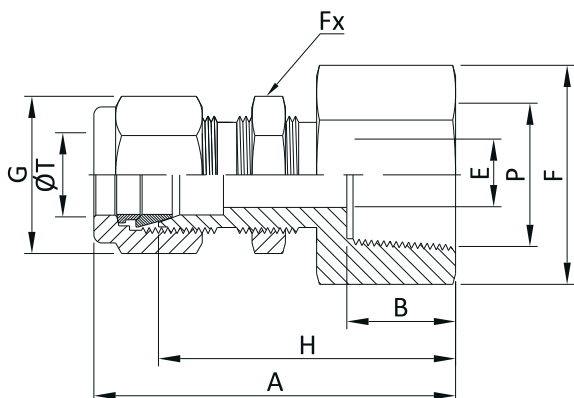
## (INCH OD Tubes X Male NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A     | B    | ØE   | F<br>A/F | G<br>A/F | Fx<br>A/F | H    |
|------------------------------|-------------------------|--------------------------|-------|------|------|----------|----------|-----------|------|
|                              | T<br>Tube<br>OD<br>(in) | P<br>NPT<br>Male<br>(in) |       |      |      |          |          |           |      |
| IXX-BHMC-2-2N                | 1/8                     | 1/8                      | 46.4  | 9.6  | 2.4  | 14.0     | 11.0     | 14.0      | 39.8 |
| IXX-BHMC-4-2N                | 1/4                     | 1/8                      | 49.5  | 9.6  | 4.8  | 16.0     | 14.0     | 16.0      | 42.2 |
| IXX-BHMC-4-4N                | 1/4                     | 1/4                      | 54.1  | 14.3 | 4.8  | 16.0     | 14.0     | 16.0      | 46.7 |
| IXX-BHMC-6-4N                | 3/8                     | 1/4                      | 57.4  | 14.3 | 7.1  | 19.0     | 17.0     | 19.0      | 50.0 |
| IXX-BHMC-6-6N                | 3/8                     | 3/8                      | 57.4  | 14.3 | 7.1  | 19.0     | 17.0     | 19.0      | 50.0 |
| IXX-BHMC-6-8N                | 3/8                     | 1/2                      | 63.7  | 19.1 | 7.1  | 22.0     | 17.0     | 22.0      | 56.5 |
| IXX-BHMC-8-6N                | 1/2                     | 3/8                      | 63.3  | 14.3 | 9.6  | 24.0     | 22.0     | 24.0      | 53.0 |
| IXX-BHMC-8-8N                | 1/2                     | 1/2                      | 68.8  | 19.1 | 10.4 | 24.0     | 22.0     | 24.0      | 58.8 |
| IXX-BHMC-12-12N              | 3/4                     | 3/4                      | 76.2  | 19.1 | 15.8 | 30.0     | 28.5     | 30.0      | 66.9 |
| IXX-BHMC-16-16N              | 1                       | 1                        | 93.2  | 23.9 | 22.3 | 41.0     | 38.0     | 41.0      | 81.0 |
| IXX-BHMC-20-20N              | 1-1/4                   | 1-1/4                    | 110.5 | 23.9 | 27.6 | 50.0     | 50.0     | 50.0      | 87.5 |
| IXX-BHMC-24-24N              | 1-1/2                   | 1-1/2                    | 122.6 | 26.2 | 34.0 | 60.0     | 57.0     | 60.0      | 95.5 |

## (METRIC OD Tubes X Male NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A     | B    | ØE   | F<br>A/F | G<br>A/F | Fx<br>A/F | H    |
|------------------------------|-------------------------|--------------------------|-------|------|------|----------|----------|-----------|------|
|                              | T<br>Tube<br>OD<br>(mm) | P<br>NPT<br>Male<br>(in) |       |      |      |          |          |           |      |
| IXX-BHMC-3M-2N               | 3                       | 1/8                      | 46.4  | 9.6  | 2.4  | 11.0     | 11.0     | 11.0      | 39.8 |
| IXX-BHMC-6M-2N               | 6                       | 1/8                      | 49.5  | 9.6  | 4.8  | 16.0     | 14.0     | 16.0      | 42.2 |
| IXX-BHMC-10M-4N              | 10                      | 1/4                      | 57.4  | 14.3 | 7.1  | 19.0     | 17.0     | 19.0      | 50.0 |
| IXX-BHMC-10M-6N              | 10                      | 3/8                      | 57.4  | 14.3 | 7.1  | 19.0     | 17.0     | 19.0      | 50.0 |
| IXX-BHMC-12M-6N              | 12                      | 3/8                      | 63.3  | 14.3 | 9.6  | 24.0     | 22.0     | 24.0      | 53.0 |
| IXX-BHMC-12M-8N              | 12                      | 1/2                      | 68.8  | 19.1 | 10.4 | 24.0     | 22.0     | 24.0      | 58.8 |
| IXX-BHMC-16M-8N              | 16                      | 1/2                      | 69.6  | 19.1 | 11.9 | 27.0     | 25.0     | 27.0      | 59.5 |
| IXX-BHMC-22M-12N             | 22                      | 3/4                      | 83.3  | 19.1 | 15.8 | 35.0     | 25.0     | 35.0      | 73.2 |
| IXX-BHMC-25M-16N             | 25                      | 1                        | 93.2  | 23.9 | 22.3 | 41.0     | 38.0     | 41.0      | 81.0 |
| IXX-BHMC-32M-20N             | 32                      | 1-1/4                    | 110.5 | 23.9 | 28.6 | 50.0     | 50.0     | 50.0      | 87.5 |
| IXX-BHMC-38M-24N             | 38                      | 1-1/2                    | 122.8 | 26.2 | 33.7 | 60.0     | 57.0     | 60.0      | 95.5 |

# BULKHEAD FEMALE CONNECTOR



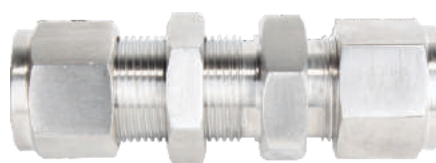
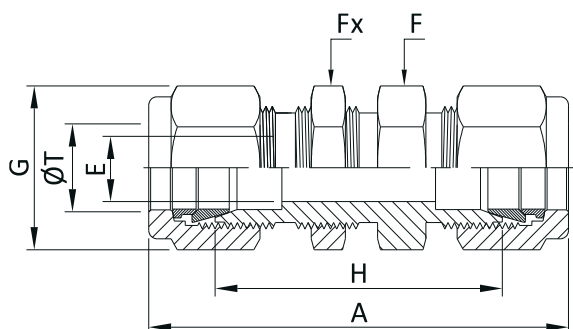
## (INCH OD Tubes X Female NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                            | A     | B    | ØE   | F<br>A/F | G<br>A/F | Fx<br>A/F | H    |
|------------------------------|-------------------------|----------------------------|-------|------|------|----------|----------|-----------|------|
|                              | T<br>Tube<br>OD<br>(in) | P<br>NPT<br>Female<br>(in) |       |      |      |          |          |           |      |
| IXX-BHFC-2-2N                | 1/8                     | 1/8                        | 44.7  | 10.4 | 2.4  | 14.0     | 11.0     | 14.0      | 38.1 |
| IXX-BHFC-4-2N                | 1/4                     | 1/8                        | 47.0  | 10.4 | 4.8  | 16.0     | 14.0     | 16.0      | 39.7 |
| IXX-BHFC-4-4N                | 1/4                     | 1/4                        | 51.5  | 15.0 | 4.8  | 19.0     | 14.0     | 19.0      | 44.2 |
| IXX-BHFC-6-4N                | 3/8                     | 1/4                        | 54.8  | 15.0 | 7.1  | 19.0     | 17.0     | 19.0      | 47.5 |
| IXX-BHFC-8-6N                | 1/2                     | 3/8                        | 61.7  | 15.0 | 10.4 | 22.0     | 22.0     | 22.0      | 51.6 |
| IXX-BHFC-8-8N                | 1/2                     | 1/2                        | 66.7  | 19.8 | 10.4 | 27.0     | 22.0     | 27.0      | 56.6 |
| IXX-BHFC-10-8N               | 5/8                     | 1/2                        | 67.6  | 19.8 | 12.7 | 27.0     | 25.0     | 27.0      | 57.4 |
| IXX-BHFC-12-8N               | 3/4                     | 1/2                        | 72.4  | 19.8 | 16.0 | 35.0     | 28.5     | 35.0      | 62.3 |
| IXX-BHFC-12-12N              | 3/4                     | 3/4                        | 74.7  | 20.6 | 16.0 | 35.0     | 28.5     | 35.0      | 64.3 |
| IXX-BHFC-16-12N              | 1                       | 3/4                        | 84.3  | 20.6 | 16.0 | 35.0     | 38.0     | 35.0      | 72.1 |
| IXX-BHFC-16-16N              | 1                       | 1                          | 93.2  | 25.4 | 22.2 | 35.0     | 38.0     | 35.0      | 81.0 |
| IXX-BHFC-20-20N              | 1-1/4                   | 1-1/4                      | 105.7 | 25.4 | 27.6 | 50.0     | 50.0     | 50.0      | 83.5 |
| IXX-BHFC-24-24N              | 1-1/2                   | 1-1/2                      | 144.5 | 27.6 | 34.0 | 60.0     | 57.0     | 60.0      | 87.4 |

## (METRIC OD Tubes X Female NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                            | A     | B    | ØE   | F<br>A/F | G<br>A/F | Fx<br>A/F | H    |
|------------------------------|-------------------------|----------------------------|-------|------|------|----------|----------|-----------|------|
|                              | T<br>Tube<br>OD<br>(mm) | P<br>NPT<br>Female<br>(in) |       |      |      |          |          |           |      |
| IXX-BHFC-3M-2N               | 3                       | 1/8                        | 44.7  | 10.4 | 2.4  | 14.0     | 11.0     | 14.0      | 38.1 |
| IXX-BHFC-6M-4N               | 6                       | 1/4                        | 51.6  | 15.0 | 4.8  | 19.0     | 14.0     | 19.0      | 44.2 |
| IXX-BHFC-10M-6N              | 10                      | 3/8                        | 56.8  | 15.0 | 7.9  | 22.0     | 19.0     | 22.0      | 49.2 |
| IXX-BHFC-12M-6N              | 12                      | 3/8                        | 61.8  | 15.0 | 9.5  | 24.0     | 22.0     | 24.0      | 51.7 |
| IXX-BHFC-12M-8N              | 12                      | 1/2                        | 66.7  | 19.8 | 9.5  | 27.0     | 22.0     | 27.0      | 56.6 |
| IXX-BHFC-16M-8N              | 16                      | 1/2                        | 67.5  | 20.6 | 12.7 | 27.0     | 25.0     | 27.0      | 57.4 |
| IXX-BHFC-22M-12N             | 22                      | 3/4                        | 79.9  | 20.6 | 15.8 | 35.0     | 35.0     | 35.0      | 69.8 |
| IXX-BHFC-25M-12N             | 25                      | 3/4                        | 84.3  | 20.6 | 15.8 | 35.0     | 38.0     | 35.0      | 72.1 |
| IXX-BHFC-25M-16N             | 25                      | 1                          | 93.2  | 25.4 | 22.3 | 35.0     | 38.0     | 35.0      | 81.0 |
| IXX-BHFC-32M-20N             | 32                      | 1-1/4                      | 105.7 | 25.4 | 27.6 | 50.0     | 50.0     | 50.0      | 83.5 |
| IXX-BHFC-38M-24N             | 38                      | 1-1/2                      | 114.5 | 27.6 | 33.7 | 60.0     | 57.0     | 60.0      | 87.4 |

# BULKHEAD UNION



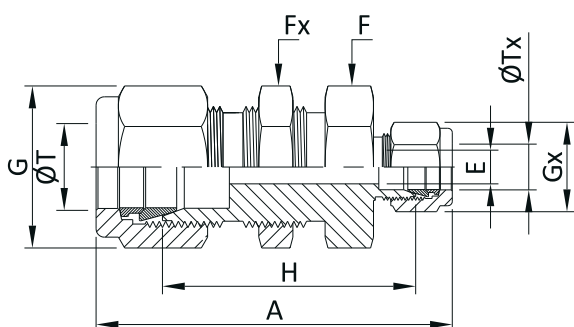
## (INCH OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.<br>T<br>Tube<br>OD<br>(in) | A     | ØE   | F<br>A/F | G<br>A/F | Fx<br>A/F | H     |
|------------------------------|--------------------------------------|-------|------|----------|----------|-----------|-------|
|                              |                                      |       |      |          |          |           |       |
| IXX-BHU-1                    | 1/16                                 | 31.5  | 1.3  | 11.0     | 8.0      | 11.0      | 23.8  |
| IXX-BHU-2                    | 1/8                                  | 51.3  | 2.4  | 11.0     | 11.0     | 11.0      | 38.1  |
| IXX-BHU-4                    | 1/4                                  | 57.6  | 4.8  | 16.0     | 14.0     | 16.0      | 43.0  |
| IXX-BHU-5                    | 5/16                                 | 60.7  | 6.3  | 17.0     | 16.0     | 17.0      | 46.0  |
| IXX-BHU-6                    | 3/8                                  | 62.2  | 7.1  | 22.0     | 17.0     | 22.0      | 47.5  |
| IXX-BHU-8                    | 1/2                                  | 71.1  | 10.4 | 24.0     | 22.0     | 24.0      | 50.8  |
| IXX-BHU-10                   | 5/8                                  | 72.6  | 12.7 | 27.0     | 25.0     | 27.0      | 52.3  |
| IXX-BHU-12                   | 3/4                                  | 79.0  | 16.0 | 30.0     | 28.5     | 30.0      | 58.6  |
| IXX-BHU-16                   | 1                                    | 95.6  | 22.3 | 35.0     | 38.0     | 35.0      | 71.3  |
| IXX-BHU-20                   | 1-1/4                                | 123.2 | 27.6 | 50.0     | 50.0     | 50.0      | 79.0  |
| IXX-BHU-24                   | 1-1/2                                | 139.2 | 34.0 | 60.0     | 57.0     | 60.0      | 84.8  |
| IXX-BHU-32                   | 2                                    | 180.4 | 46.0 | 70.0     | 76.0     | 70.0      | 105.6 |

## (METRIC OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.<br>T<br>Tube<br>OD<br>(mm) | A     | ØE   | F<br>A/F | G<br>A/F | Fx<br>A/F | H    |
|------------------------------|--------------------------------------|-------|------|----------|----------|-----------|------|
|                              |                                      |       |      |          |          |           |      |
| IXX-BHU-3M                   | 3                                    | 51.3  | 2.4  | 14.0     | 11.0     | 14.0      | 38.1 |
| IXX-BHU-6M                   | 6                                    | 57.7  | 4.8  | 16.0     | 14.0     | 16.0      | 42.9 |
| IXX-BHU-8M                   | 8                                    | 61.0  | 6.3  | 17.0     | 16.0     | 17.0      | 46.0 |
| IXX-BHU-10M                  | 10                                   | 63.7  | 7.9  | 22.0     | 19.0     | 22.0      | 48.5 |
| IXX-BHU-12M                  | 12                                   | 71.0  | 9.5  | 24.0     | 22.0     | 24.0      | 50.8 |
| IXX-BHU-14M                  | 14                                   | 72.5  | 11.1 | 27.0     | 25.0     | 27.0      | 52.3 |
| IXX-BHU-15M                  | 15                                   | 72.5  | 11.9 | 27.0     | 25.0     | 27.0      | 52.3 |
| IXX-BHU-16M                  | 16                                   | 72.5  | 12.7 | 27.0     | 25.0     | 27.0      | 52.3 |
| IXX-BHU-18M                  | 18                                   | 78.9  | 15.1 | 30.0     | 30.0     | 30.0      | 58.7 |
| IXX-BHU-20M                  | 20                                   | 84.5  | 15.8 | 35.0     | 32.0     | 35.0      | 64.3 |
| IXX-BHU-25M                  | 25                                   | 95.6  | 22.3 | 35.0     | 38.0     | 35.0      | 71.3 |
| IXX-BHU-30M                  | 30                                   | 123.7 | 26.2 | 50.0     | 46.0     | 50.0      | 80.5 |
| IXX-BHU-32M                  | 32                                   | 128.3 | 27.6 | 50.0     | 50.0     | 50.0      | 82.3 |
| IXX-BHU-38M                  | 38                                   | 144.6 | 33.7 | 60.0     | 57.0     | 60.0      | 89.4 |

# BULKHEAD REDUCING UNION



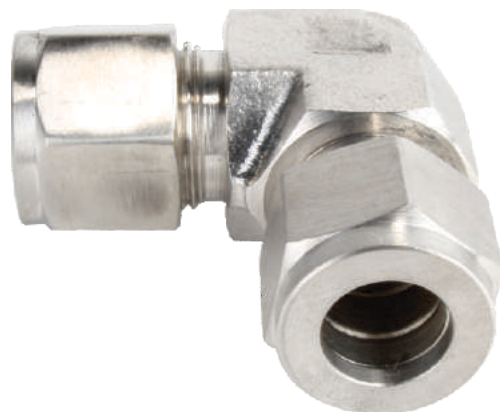
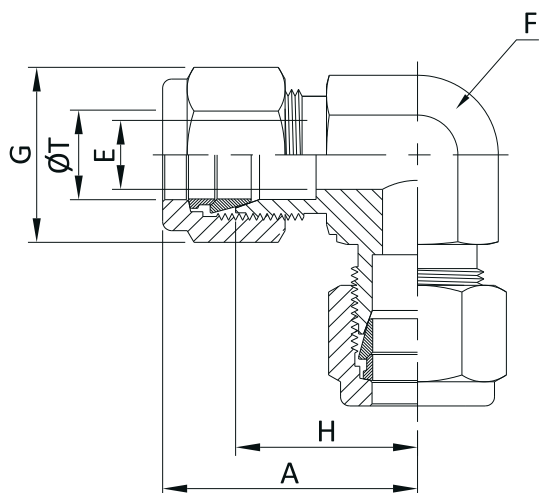
## (INCH OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A    | ØE  | F<br>A/F | G<br>A/F | Gx<br>A/F | Fx<br>A/F | H    |
|------------------------------|-------------------------|--------------------------|------|-----|----------|----------|-----------|-----------|------|
|                              | T<br>Tube<br>OD<br>(in) | Tx<br>Tube<br>OD<br>(in) |      |     |          |          |           |           |      |
| IXX-BHRU-4-2                 | 1/4                     | 1/8                      | 55.2 | 2.4 | 16.0     | 14.0     | 11.0      | 16.0      | 41.2 |
| IXX-BHRU-6-4                 | 3/8                     | 1/4                      | 60.7 | 4.8 | 22.0     | 17.0     | 14.0      | 22.0      | 46.0 |
| IXX-BHRU-8-4                 | 1/2                     | 1/4                      | 66.8 | 4.8 | 24.0     | 22.0     | 14.0      | 24.0      | 49.2 |
| IXX-BHRU-8-6                 | 1/2                     | 3/8                      | 66.8 | 7.1 | 24.0     | 22.0     | 17.0      | 24.0      | 49.2 |

## (METRIC OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A    | ØE  | F<br>A/F | G<br>A/F | Gx<br>A/F | Fx<br>A/F | H    |
|------------------------------|-------------------------|--------------------------|------|-----|----------|----------|-----------|-----------|------|
|                              | T<br>Tube<br>OD<br>(mm) | Tx<br>Tube<br>OD<br>(mm) |      |     |          |          |           |           |      |
| IXX-BHRU-6M-3M               | 6                       | 3                        | 56.0 | 2.4 | 16.0     | 14.0     | 11.0      | 16.0      | 41.2 |
| IXX-BHRU-8M-6M               | 8                       | 6                        | 61.0 | 4.8 | 17.0     | 16.0     | 14.0      | 17.0      | 48.0 |
| IXX-BHRU-10M-6M              | 10                      | 6                        | 63.7 | 4.8 | 22.0     | 19.0     | 14.0      | 22.0      | 48.5 |
| IXX-BHRU-12M-6M              | 12                      | 6                        | 71.0 | 4.8 | 24.0     | 22.0     | 14.0      | 24.0      | 50.8 |
| IXX-BHRU-12M-10M             | 12                      | 10                       | 71.0 | 7.9 | 24.0     | 22.0     | 17.0      | 24.0      | 50.8 |

# UNION ELBOW



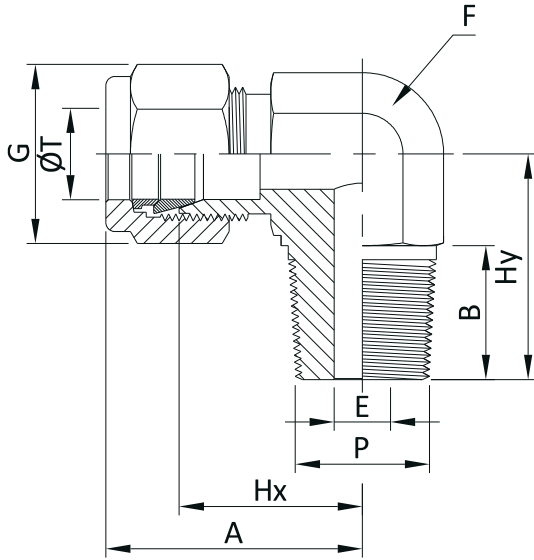
## (INCH OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               | A     | ØE   | F<br>A/F | G<br>A/F | H    |
|------------------------------|-------------------------|-------|------|----------|----------|------|
|                              | T<br>Tube<br>OD<br>(in) |       |      |          |          |      |
|                              |                         | (mm)  |      |          |          |      |
| IXX-UE-1                     | 1/16                    | 17.8  | 1.3  | 11.0     | 8.0      | 14.0 |
| IXX-UE-2                     | 1/8                     | 22.4  | 2.4  | 11.0     | 11.0     | 15.8 |
| IXX-UE-4                     | 1/4                     | 26.9  | 4.8  | 14.0     | 14.0     | 19.6 |
| IXX-UE-5                     | 5/16                    | 28.7  | 6.3  | 16.0     | 16.0     | 21.3 |
| IXX-UE-6                     | 3/8                     | 30.5  | 7.1  | 17.0     | 17.0     | 23.2 |
| IXX-UE-8                     | 1/2                     | 36.0  | 10.4 | 22.0     | 22.0     | 25.9 |
| IXX-UE-10                    | 5/8                     | 38.1  | 12.7 | 24.0     | 25.0     | 27.9 |
| IXX-UE-12                    | 3/4                     | 39.9  | 15.8 | 27.0     | 28.5     | 29.7 |
| IXX-UE-14                    | 7/8                     | 44.7  | 18.2 | 35.0     | 32.0     | 34.6 |
| IXX-UE-16                    | 1                       | 49.0  | 22.3 | 35.0     | 38.0     | 36.8 |
| IXX-UE-20                    | 1-1/4                   | 66.6  | 27.6 | 46.0     | 50.0     | 44.5 |
| IXX-UE-24                    | 1-1/2                   | 78.0  | 34.0 | 55.0     | 57.0     | 50.8 |
| IXX-UE-32                    | 2                       | 107.2 | 46.0 | 70.0     | 76.0     | 69.9 |

## (METRIC OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               | A    | ØE   | F<br>A/F | G<br>A/F | H    |
|------------------------------|-------------------------|------|------|----------|----------|------|
|                              | T<br>Tube<br>OD<br>(mm) |      |      |          |          |      |
|                              |                         | (mm) |      |          |          |      |
| IXX-UE-3M                    | 3                       | 22.3 | 2.4  | 11.0     | 11.0     | 15.7 |
| IXX-UE-6M                    | 6                       | 27.0 | 4.8  | 14.0     | 14.0     | 19.6 |
| IXX-UE-8M                    | 8                       | 28.8 | 6.3  | 16.0     | 16.0     | 21.3 |
| IXX-UE-10M                   | 10                      | 31.5 | 7.9  | 17.0     | 19.0     | 23.9 |
| IXX-UE-12M                   | 12                      | 36.0 | 9.5  | 22.0     | 22.0     | 25.9 |
| IXX-UE-14M                   | 14                      | 38.0 | 11.1 | 24.0     | 25.0     | 27.9 |
| IXX-UE-15M                   | 15                      | 38.0 | 11.9 | 24.0     | 25.0     | 27.9 |
| IXX-UE-16M                   | 16                      | 38.0 | 12.7 | 24.0     | 25.0     | 27.9 |
| IXX-UE-18M                   | 18                      | 39.8 | 15.1 | 27.0     | 30.0     | 29.7 |
| IXX-UE-20M                   | 20                      | 44.6 | 15.9 | 32.0     | 32.0     | 34.5 |
| IXX-UE-22M                   | 22                      | 44.6 | 18.3 | 32.0     | 32.0     | 34.5 |
| IXX-UE-25M                   | 25                      | 49.1 | 21.8 | 35.0     | 38.0     | 36.8 |
| IXX-UE-28M                   | 28                      | 64.0 | 21.8 | 41.0     | 46.0     | 43.5 |
| IXX-UE-30M                   | 30                      | 69.9 | 26.2 | 46.0     | 50.0     | 48.3 |
| IXX-UE-32M                   | 32                      | 72.3 | 28.6 | 46.0     | 50.0     | 49.3 |
| IXX-UE-38M                   | 38                      | 84.0 | 33.7 | 55.0     | 57.0     | 56.4 |

# MALE ELBOW



## (INCH OD Tubes x Male NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A     | B    | ØE   | F<br>A/F | G<br>A/F | Hy   | Hx   |
|------------------------------|-------------------------|--------------------------|-------|------|------|----------|----------|------|------|
|                              | T<br>Tube<br>OD<br>(in) | P<br>NPT<br>Male<br>(in) |       |      |      |          |          |      |      |
| IXX-ME-1-1N                  | 1/16                    | 1/16                     | 19.0  | 9.6  | 1.3  | 11.0     | 11.0     | 17.8 | 15.3 |
| IXX-ME-1-2N                  | 1/16                    | 1/8                      | 19.0  | 9.6  | 1.3  | 11.0     | 11.0     | 17.8 | 15.3 |
| IXX-ME-2-2N                  | 1/8                     | 1/8                      | 23.6  | 9.6  | 2.4  | 11.0     | 11.0     | 17.8 | 17.0 |
| IXX-ME-2-4N                  | 1/8                     | 1/4                      | 24.6  | 14.3 | 2.4  | 14.0     | 11.0     | 23.4 | 18.0 |
| IXX-ME-4-2N                  | 1/4                     | 1/8                      | 26.9  | 9.6  | 4.8  | 14.0     | 14.0     | 18.8 | 19.6 |
| IXX-ME-4-4N                  | 1/4                     | 1/4                      | 26.9  | 14.3 | 4.8  | 14.0     | 14.0     | 23.4 | 19.6 |
| IXX-ME-4-6N                  | 1/4                     | 3/8                      | 29.7  | 14.3 | 4.8  | 19.0     | 14.0     | 26.2 | 22.4 |
| IXX-ME-4-8N                  | 1/4                     | 1/2                      | 31.8  | 19.1 | 4.8  | 22.0     | 14.0     | 33.0 | 24.4 |
| IXX-ME-5-4N                  | 5/16                    | 1/4                      | 28.7  | 9.6  | 6.3  | 14.0     | 16.0     | 24.4 | 21.3 |
| IXX-ME-6-2N                  | 3/8                     | 1/8                      | 30.5  | 9.6  | 4.8  | 14.0     | 17.0     | 20.9 | 23.1 |
| IXX-ME-6-4N                  | 3/8                     | 1/4                      | 30.5  | 14.3 | 7.1  | 17.0     | 17.0     | 25.4 | 23.1 |
| IXX-ME-6-6N                  | 3/8                     | 3/8                      | 31.2  | 14.3 | 7.1  | 19.0     | 17.0     | 26.2 | 23.9 |
| IXX-ME-6-8N                  | 3/8                     | 1/2                      | 33.3  | 19.1 | 7.1  | 22.0     | 17.0     | 33.0 | 25.9 |
| IXX-ME-8-4N                  | 1/2                     | 1/4                      | 36.0  | 14.3 | 4.8  | 22.0     | 22.0     | 28.2 | 25.9 |
| IXX-ME-8-6N                  | 1/2                     | 3/8                      | 36.0  | 14.3 | 9.6  | 22.0     | 22.0     | 28.2 | 25.9 |
| IXX-ME-8-8N                  | 1/2                     | 1/2                      | 36.0  | 19.1 | 10.4 | 22.0     | 22.0     | 33.0 | 25.9 |
| IXX-ME-8-12N                 | 1/2                     | 3/4                      | 39.9  | 19.1 | 10.4 | 27.0     | 22.0     | 36.8 | 29.7 |
| IXX-ME-10-8N                 | 5/8                     | 1/2                      | 38.1  | 19.1 | 11.9 | 24.0     | 25.0     | 35.0 | 27.9 |
| IXX-ME-12-8N                 | 3/4                     | 1/2                      | 39.9  | 19.1 | 11.9 | 27.0     | 28.5     | 36.8 | 29.7 |
| IXX-ME-12-12N                | 3/4                     | 3/4                      | 39.9  | 19.1 | 15.8 | 27.0     | 28.5     | 36.8 | 29.7 |
| IXX-ME-14-12N                | 7/8                     | 3/4                      | 44.7  | 19.1 | 15.8 | 35.0     | 32.0     | 41.6 | 34.5 |
| IXX-ME-16-12N                | 1                       | 3/4                      | 49.0  | 19.1 | 15.8 | 35.0     | 38.0     | 41.6 | 36.8 |
| IXX-ME-16-16N                | 1                       | 1                        | 49.0  | 23.8 | 22.3 | 35.0     | 38.0     | 46.5 | 36.8 |
| IXX-ME-20-20N                | 1-1/4                   | 1-1/4                    | 66.5  | 23.8 | 27.6 | 46.0     | 50.0     | 47.8 | 44.5 |
| IXX-ME-24-24N                | 1-1/2                   | 1-1/2                    | 78.0  | 26.2 | 34.0 | 55.0     | 57.0     | 60.4 | 50.8 |
| IXX-ME-32-32N                | 2                       | 2                        | 107.2 | 26.9 | 46.0 | 70.0     | 76.0     | 70.6 | 69.9 |

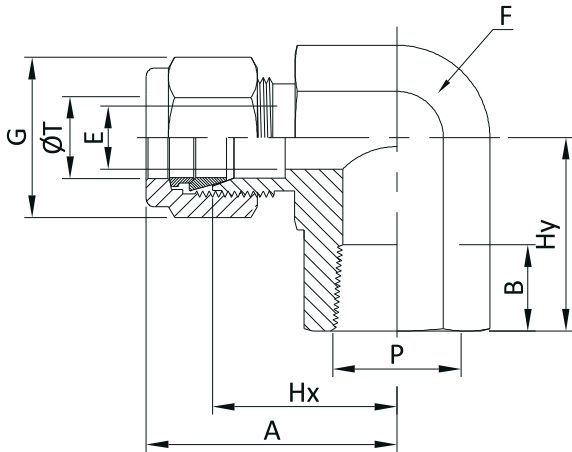
## (METRIC OD Tubes x Male NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A    | B    | ØE   | F<br>A/F | G<br>A/F | Hy   | Hx   |
|------------------------------|-------------------------|--------------------------|------|------|------|----------|----------|------|------|
|                              | T<br>Tube<br>OD<br>(mm) | P<br>NPT<br>Male<br>(in) |      |      |      |          |          |      |      |
| IXX-ME-3M-2N                 | 3                       | 1/8                      | 23.6 | 9.6  | 2.4  | 11.0     | 11.0     | 17.8 | 17.0 |
| IXX-ME-3M-4N                 | 3                       | 1/4                      | 24.6 | 14.3 | 2.4  | 14.0     | 11.0     | 23.4 | 18.0 |
| IXX-ME-6M-2N                 | 6                       | 1/8                      | 27.0 | 9.6  | 4.8  | 14.0     | 14.0     | 18.8 | 19.6 |
| IXX-ME-6M-4N                 | 6                       | 1/4                      | 27.0 | 14.3 | 4.8  | 14.0     | 14.0     | 23.4 | 19.6 |
| IXX-ME-6M-6N                 | 6                       | 3/8                      | 29.8 | 14.3 | 4.8  | 19.0     | 14.0     | 26.2 | 22.4 |
| IXX-ME-6M-8N                 | 6                       | 1/2                      | 31.8 | 19.1 | 4.8  | 22.0     | 14.0     | 33.0 | 24.4 |
| IXX-ME-8M-2N                 | 8                       | 1/8                      | 28.8 | 9.6  | 4.8  | 14.0     | 16.0     | 19.8 | 21.3 |
| IXX-ME-8M-4N                 | 8                       | 1/4                      | 28.8 | 14.3 | 6.3  | 14.0     | 16.0     | 24.4 | 21.3 |
| IXX-ME-8M-6N                 | 8                       | 3/8                      | 30.6 | 14.3 | 6.3  | 19.0     | 16.0     | 26.2 | 23.1 |
| IXX-ME-8M-8N                 | 8                       | 1/2                      | 32.6 | 19.1 | 6.3  | 22.0     | 16.0     | 33.0 | 25.1 |
| IXX-ME-10M-2N                | 10                      | 1/8                      | 31.5 | 9.6  | 4.8  | 17.0     | 19.0     | 21.6 | 23.9 |
| IXX-ME-10M-4N                | 10                      | 1/4                      | 31.5 | 14.3 | 7.1  | 17.0     | 19.0     | 26.2 | 23.9 |
| IXX-ME-10M-6N                | 10                      | 3/8                      | 31.5 | 14.3 | 7.9  | 19.0     | 19.0     | 26.2 | 23.9 |
| IXX-ME-10M-8N                | 10                      | 1/2                      | 33.0 | 19.1 | 7.9  | 22.0     | 19.0     | 33.0 | 25.9 |
| IXX-ME-12M-4N                | 12                      | 1/4                      | 36.0 | 14.3 | 7.1  | 22.0     | 22.0     | 26.2 | 25.9 |
| IXX-ME-12M-6N                | 12                      | 3/8                      | 36.0 | 14.3 | 9.5  | 22.0     | 22.0     | 38.2 | 25.9 |
| IXX-ME-12M-8N                | 12                      | 1/2                      | 36.0 | 19.1 | 9.5  | 22.0     | 22.0     | 33.0 | 25.9 |
| IXX-ME-12M-12N               | 12                      | 3/4                      | 39.8 | 19.1 | 9.5  | 27.0     | 22.0     | 36.8 | 29.7 |
| IXX-ME-15M-8N                | 15                      | 1/2                      | 38.0 | 19.1 | 11.9 | 24.0     | 25.0     | 35.1 | 27.9 |
| IXX-ME-16M-8N                | 16                      | 1/2                      | 38.0 | 19.1 | 11.9 | 24.0     | 25.0     | 35.1 | 27.9 |
| IXX-ME-16M-12N               | 16                      | 3/4                      | 39.8 | 19.1 | 27.7 | 27.0     | 25.0     | 36.8 | 29.7 |
| IXX-ME-18M-8N                | 18                      | 1/2                      | 39.8 | 19.1 | 11.9 | 27.0     | 30.0     | 36.8 | 29.7 |
| IXX-ME-18M-12N               | 18                      | 3/4                      | 39.8 | 19.1 | 15.1 | 27.0     | 30.0     | 36.8 | 29.7 |
| IXX-ME-20M-8N                | 20                      | 1/2                      | 44.6 | 19.1 | 11.9 | 35.0     | 32.0     | 41.7 | 34.5 |
| IXX-ME-20M-12N               | 20                      | 3/4                      | 44.6 | 19.1 | 15.9 | 35.0     | 32.0     | 41.7 | 34.5 |
| IXX-ME-22M-12N               | 22                      | 3/4                      | 44.6 | 19.1 | 15.9 | 35.0     | 32.0     | 41.7 | 34.5 |
| IXX-ME-22M-16N               | 22                      | 1                        | 44.6 | 23.9 | 18.3 | 35.0     | 32.0     | 46.5 | 34.5 |
| IXX-ME-25M-12N               | 25                      | 3/4                      | 49.1 | 19.1 | 59.9 | 35.0     | 38.0     | 41.7 | 36.8 |
| IXX-ME-25M-16N               | 25                      | 1                        | 41.1 | 23.9 | 21.8 | 35.0     | 38.0     | 46.5 | 36.8 |
| IXX-ME-30M-20N               | 30                      | 1-1/4                    | 69.9 | 23.9 | 26.2 | 45.0     | 50.0     | 53.1 | 48.3 |
| IXX-ME-32M-20N               | 32                      | 1-1/4                    | 72.3 | 23.9 | 27.6 | 45.0     | 50.0     | 53.1 | 49.3 |
| IXX-ME-38M-24N               | 38                      | 1-1/2                    | 84.0 | 26.2 | 33.7 | 55.0     | 57.0     | 60.4 | 56.4 |





# FEMALE ELBOW



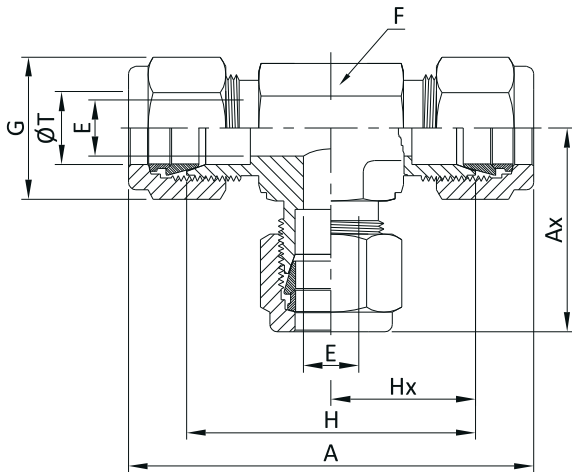
## (INCH OD Tubes x Female NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                            | A    | B    | ØE   | F<br>A/F | G<br>A/F | Hy   | Hx   |
|------------------------------|-------------------------|----------------------------|------|------|------|----------|----------|------|------|
|                              | T<br>Tube<br>OD<br>(in) | P<br>NPT<br>Female<br>(in) |      |      |      |          |          |      |      |
| IXX-FE-2-2N                  | 1/8                     | 1/8                        | 24.6 | 10.4 | 2.4  | 14.0     | 11.0     | 19.0 | 18.0 |
| IXX-FE-2-4N                  | 1/8                     | 1/4                        | 27.4 | 15.0 | 2.4  | 19.0     | 11.0     | 22.4 | 20.8 |
| IXX-FE-4-2N                  | 1/4                     | 1/8                        | 26.9 | 10.4 | 4.8  | 14.0     | 14.0     | 19.0 | 19.6 |
| IXX-FE-4-4N                  | 1/4                     | 1/4                        | 29.7 | 15.0 | 4.8  | 19.0     | 14.0     | 22.4 | 22.4 |
| IXX-FE-4-6N                  | 1/4                     | 3/8                        | 31.8 | 15.0 | 4.8  | 22.0     | 14.0     | 22.4 | 24.4 |
| IXX-FE-4-8N                  | 1/4                     | 1/2                        | 34.6 | 19.8 | 4.8  | 27.0     | 14.0     | 28.5 | 27.2 |
| IXX-FE-5-2N                  | 5/16                    | 1/8                        | 28.7 | 10.4 | 6.3  | 19.0     | 14.0     | 19.1 | 21.4 |
| IXX-FE-5-4N                  | 5/16                    | 1/4                        | 30.5 | 15.0 | 6.3  | 22.0     | 16.0     | 22.4 | 23.2 |
| IXX-FE-6-2N                  | 3/8                     | 1/8                        | 30.5 | 10.4 | 7.1  | 17.0     | 17.0     | 19.1 | 23.2 |
| IXX-FE-6-4N                  | 3/8                     | 1/4                        | 31.2 | 15.0 | 7.1  | 19.0     | 17.0     | 22.4 | 23.9 |
| IXX-FE-6-6N                  | 3/8                     | 3/8                        | 33.3 | 15.0 | 7.1  | 22.0     | 17.0     | 22.4 | 25.9 |
| IXX-FE-6-8N                  | 3/8                     | 1/2                        | 36.0 | 19.8 | 7.1  | 27.0     | 17.0     | 28.5 | 28.7 |
| IXX-FE-8-4N                  | 1/2                     | 1/4                        | 36.0 | 15.0 | 7.1  | 22.0     | 22.0     | 22.4 | 25.9 |
| IXX-FE-8-6N                  | 1/2                     | 3/8                        | 36.0 | 15.0 | 10.4 | 22.0     | 22.0     | 22.4 | 25.9 |
| IXX-FE-8-8N                  | 1/2                     | 1/2                        | 38.9 | 19.8 | 10.4 | 27.0     | 22.0     | 28.5 | 28.7 |
| IXX-FE-10-6N                 | 5/8                     | 3/8                        | 38.1 | 15.0 | 12.7 | 24.0     | 22.0     | 22.4 | 28.0 |
| IXX-FE-10-8N                 | 5/8                     | 1/2                        | 39.9 | 19.8 | 12.7 | 27.0     | 25.0     | 28.5 | 29.7 |
| IXX-FE-12-8N                 | 3/4                     | 1/2                        | 39.9 | 19.8 | 15.8 | 27.0     | 28.5     | 28.5 | 29.7 |
| IXX-FE-12-12N                | 3/4                     | 3/4                        | 44.7 | 20.6 | 15.8 | 35.0     | 28.5     | 31.8 | 34.6 |
| IXX-FE-14-12N                | 7/8                     | 3/4                        | 44.7 | 20.6 | 18.2 | 35.0     | 32.0     | 31.8 | 34.6 |
| IXX-FE-16-12N                | 1                       | 3/4                        | 49.0 | 20.6 | 22.3 | 35.0     | 38.0     | 31.8 | 36.8 |
| IXX-FE-16-16N                | 1                       | 1                          | 53.6 | 25.4 | 22.3 | 41.0     | 38.0     | 38.1 | 41.4 |

## (METRIC OD Tubes x Female NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                            | A    | B    | ØE   | F<br>A/F | G<br>A/F | Hy   | Hx   |
|------------------------------|-------------------------|----------------------------|------|------|------|----------|----------|------|------|
|                              | T<br>Tube<br>OD<br>(mm) | P<br>NPT<br>Female<br>(in) |      |      |      |          |          |      |      |
| IXX-FE-3M-2N                 | 3                       | 1/8                        | 24.6 | 10.4 | 2.4  | 14.0     | 11.0     | 19.0 | 18.0 |
| IXX-FE-3M-4N                 | 3                       | 1/4                        | 27.4 | 15.0 | 2.4  | 19.0     | 11.0     | 22.4 | 20.8 |
| IXX-FE-6M-2N                 | 6                       | 1/8                        | 27.0 | 10.4 | 4.8  | 14.0     | 14.0     | 19.0 | 19.6 |
| IXX-FE-6M-4N                 | 6                       | 1/4                        | 29.8 | 15.0 | 4.8  | 19.0     | 14.0     | 22.4 | 22.4 |
| IXX-FE-6M-8N                 | 6                       | 1/2                        | 34.6 | 19.8 | 4.8  | 27.0     | 14.0     | 28.5 | 27.2 |
| IXX-FE-8M-4N                 | 8                       | 1/4                        | 30.6 | 15.0 | 6.3  | 19.0     | 16.0     | 22.4 | 23.1 |
| IXX-FE-8M-6N                 | 8                       | 3/8                        | 32.6 | 15.0 | 6.3  | 22.0     | 16.0     | 22.4 | 25.1 |
| IXX-FE-10M-4N                | 10                      | 1/4                        | 33.5 | 15.0 | 7.9  | 19.0     | 19.0     | 22.4 | 25.9 |
| IXX-FE-10M-6N                | 10                      | 3/8                        | 33.5 | 15.0 | 7.9  | 22.0     | 19.0     | 22.4 | 25.9 |
| IXX-FE-12M-4N                | 12                      | 1/4                        | 36.0 | 15.0 | 9.5  | 22.0     | 22.0     | 22.4 | 25.9 |
| IXX-FE-12M-6N                | 12                      | 3/8                        | 36.0 | 15.0 | 9.5  | 22.0     | 22.0     | 22.4 | 25.9 |
| IXX-FE-12M-8N                | 12                      | 1/2                        | 38.8 | 19.8 | 9.5  | 27.0     | 22.0     | 28.5 | 28.7 |
| IXX-FE-16M-8N                | 16                      | 1/2                        | 39.5 | 19.8 | 12.7 | 27.0     | 25.0     | 28.5 | 29.7 |
| IXX-FE-25M-12N               | 25                      | 3/4                        | 49.0 | 20.6 | 22.3 | 35.0     | 38.0     | 31.8 | 36.8 |
| IXX-FE-25M-16N               | 25                      | 1                          | 53.6 | 25.4 | 22.3 | 41.0     | 38.0     | 38.1 | 41.4 |

# UNION TEE



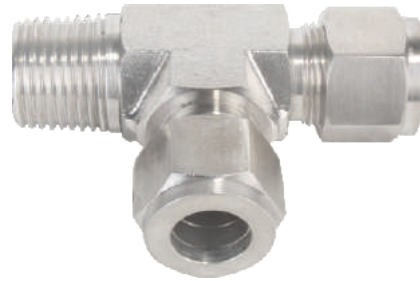
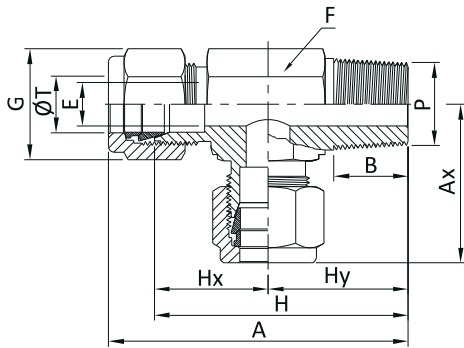
## (INCH OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.<br>T<br>Tube<br>OD<br>(in) | A     | Ax    | ØE   | F<br>A/F | G<br>A/F | H     | Hx   |
|------------------------------|--------------------------------------|-------|-------|------|----------|----------|-------|------|
|                              |                                      | (mm)  |       |      |          |          |       |      |
| IXX-UT-1                     | 1/16                                 | 35.6  | 17.8  | 1.3  | 11.0     | 8.0      | 28.0  | 14.0 |
| IXX-UT-2                     | 1/8                                  | 44.8  | 22.4  | 2.4  | 11.0     | 11.0     | 31.6  | 15.8 |
| IXX-UT-4                     | 1/4                                  | 53.8  | 26.9  | 4.8  | 14.0     | 14.0     | 39.2  | 19.6 |
| IXX-UT-5                     | 5/16                                 | 57.4  | 28.7  | 6.3  | 16.0     | 16.0     | 42.6  | 21.3 |
| IXX-UT-6                     | 3/8                                  | 61.0  | 30.5  | 7.1  | 17.0     | 17.0     | 46.4  | 23.2 |
| IXX-UT-8                     | 1/2                                  | 72.0  | 36.0  | 10.4 | 22.0     | 22.0     | 51.8  | 25.9 |
| IXX-UT-10                    | 5/8                                  | 76.2  | 38.1  | 12.7 | 24.0     | 25.0     | 55.8  | 27.9 |
| IXX-UT-12                    | 3/4                                  | 79.8  | 39.9  | 15.8 | 27.0     | 28.5     | 59.4  | 29.7 |
| IXX-UT-14                    | 7/8                                  | 89.4  | 44.7  | 18.2 | 35.0     | 32.0     | 69.2  | 34.6 |
| IXX-UT-16                    | 1                                    | 98.0  | 49.0  | 22.3 | 35.0     | 38.0     | 73.6  | 36.8 |
| IXX-UT-20                    | 1-1/4                                | 133.2 | 66.6  | 27.6 | 46.0     | 50.0     | 89.0  | 44.5 |
| IXX-UT-24                    | 1-1/2                                | 156.0 | 78.0  | 34.0 | 55.0     | 57.0     | 101.6 | 50.8 |
| IXX-UT-32                    | 2                                    | 214.4 | 107.4 | 46.0 | 70.0     | 76.0     | 139.8 | 69.9 |

## (METRIC OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.<br>T<br>Tube<br>OD<br>(mm) | A     | Ax   | ØE   | F<br>A/F | G<br>A/F | H     | Hx   |
|------------------------------|--------------------------------------|-------|------|------|----------|----------|-------|------|
|                              |                                      | (mm)  |      |      |          |          |       |      |
| IXX-UT-3M                    | 3                                    | 44.6  | 22.3 | 2.4  | 11.0     | 11.0     | 31.4  | 15.7 |
| IXX-UT-6M                    | 6                                    | 54.0  | 27.0 | 4.8  | 14.0     | 14.0     | 39.2  | 19.6 |
| IXX-UT-8M                    | 8                                    | 57.6  | 28.8 | 6.3  | 16.0     | 16.0     | 42.6  | 21.3 |
| IXX-UT-10M                   | 10                                   | 63.0  | 31.5 | 7.9  | 17.0     | 19.0     | 47.8  | 23.9 |
| IXX-UT-12M                   | 12                                   | 72.0  | 36.0 | 9.5  | 22.0     | 22.0     | 51.8  | 25.9 |
| IXX-UT-14M                   | 14                                   | 76.0  | 38.0 | 11.1 | 24.0     | 25.0     | 55.8  | 27.9 |
| IXX-UT-15M                   | 15                                   | 76.0  | 38.0 | 11.9 | 24.0     | 25.0     | 55.8  | 27.9 |
| IXX-UT-16M                   | 16                                   | 76.0  | 38.0 | 12.7 | 24.0     | 25.0     | 55.8  | 27.9 |
| IXX-UT-18M                   | 18                                   | 79.6  | 39.8 | 15.1 | 27.0     | 30.0     | 59.4  | 29.7 |
| IXX-UT-20M                   | 20                                   | 89.2  | 44.6 | 15.9 | 32.0     | 32.0     | 69.0  | 34.5 |
| IXX-UT-22M                   | 22                                   | 89.2  | 44.6 | 18.3 | 32.0     | 32.0     | 69.0  | 34.5 |
| IXX-UT-25M                   | 25                                   | 98.2  | 49.1 | 21.8 | 35.0     | 38.0     | 73.6  | 36.8 |
| IXX-UT-28M                   | 28                                   | 128.0 | 64.0 | 21.8 | 41.0     | 46.0     | 87.0  | 43.5 |
| IXX-UT-30M                   | 30                                   | 139.8 | 69.9 | 26.2 | 46.0     | 50.0     | 96.6  | 48.3 |
| IXX-UT-32M                   | 32                                   | 144.6 | 72.3 | 28.6 | 46.0     | 50.0     | 98.6  | 49.3 |
| IXX-UT-38M                   | 38                                   | 168.0 | 84.0 | 33.7 | 55.0     | 57.0     | 112.8 | 56.4 |

# MALE RUN TEE



## (INCH OD Tubes X Male NPT)

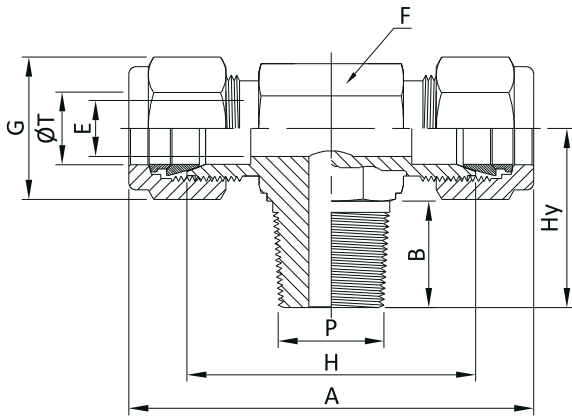
| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A     | Ax   | B    | ØE   | F<br>A/F | G<br>A/F | Hy   | H     | Hx   |
|------------------------------|-------------------------|--------------------------|-------|------|------|------|----------|----------|------|-------|------|
|                              | T<br>Tube<br>OD<br>(in) | P<br>NPT<br>Male<br>(in) |       |      |      |      |          |          |      |       |      |
| (mm)                         |                         |                          |       |      |      |      |          |          |      |       |      |
| IXX-MRT-2-2N                 | 1/8                     | 1/8                      | 41.4  | 23.6 | 9.6  | 2.4  | 11.0     | 11.0     | 17.8 | 34.8  | 17.0 |
| IXX-MRT-2-4N                 | 1/8                     | 1/4                      | 48.0  | 24.6 | 14.3 | 2.4  | 14.0     | 11.0     | 23.4 | 41.4  | 18.0 |
| IXX-MRT-4-2N                 | 1/4                     | 1/8                      | 45.7  | 26.9 | 9.6  | 4.8  | 14.0     | 14.0     | 18.8 | 38.4  | 19.6 |
| IXX-MRT-4-4N                 | 1/4                     | 1/4                      | 50.3  | 26.9 | 14.3 | 4.8  | 14.0     | 14.0     | 23.4 | 43.0  | 19.6 |
| IXX-MRT-4-6N                 | 1/4                     | 3/8                      | 55.9  | 29.7 | 14.3 | 4.8  | 19.0     | 14.0     | 26.2 | 48.8  | 22.4 |
| IXX-MRT-4-8N                 | 1/4                     | 1/2                      | 64.8  | 31.8 | 19.1 | 4.8  | 22.0     | 14.0     | 33.0 | 57.4  | 24.4 |
| IXX-MRT-6-4N                 | 3/8                     | 1/4                      | 55.9  | 30.5 | 14.3 | 7.1  | 17.0     | 17.0     | 25.4 | 48.5  | 23.1 |
| IXX-MRT-6-6N                 | 3/8                     | 3/8                      | 57.4  | 31.2 | 14.3 | 7.1  | 19.0     | 17.0     | 26.2 | 50.1  | 23.9 |
| IXX-MRT-6-8N                 | 3/8                     | 1/2                      | 66.0  | 33.0 | 19.1 | 7.1  | 22.0     | 17.0     | 33.0 | 58.9  | 25.9 |
| IXX-MRT-8-4N                 | 1/2                     | 1/4                      | 64.2  | 36.0 | 14.3 | 4.8  | 22.0     | 22.0     | 28.2 | 54.1  | 25.9 |
| IXX-MRT-8-6N                 | 1/2                     | 3/8                      | 64.2  | 36.0 | 14.3 | 9.6  | 22.0     | 22.0     | 28.2 | 54.1  | 25.9 |
| IXX-MRT-8-8N                 | 1/2                     | 1/2                      | 69.0  | 36.0 | 19.1 | 10.4 | 22.0     | 22.0     | 33.0 | 58.9  | 25.9 |
| IXX-MRT-10-8N                | 5/8                     | 1/2                      | 73.1  | 38.1 | 19.1 | 11.9 | 22.0     | 25.0     | 35.0 | 62.9  | 27.9 |
| IXX-MRT-12-8N                | 3/4                     | 1/2                      | 76.7  | 39.9 | 19.1 | 11.9 | 27.0     | 29.0     | 36.8 | 66.5  | 29.7 |
| IXX-MRT-12-12N               | 3/4                     | 3/4                      | 76.7  | 39.9 | 19.1 | 15.8 | 27.0     | 29.0     | 36.8 | 66.5  | 29.7 |
| IXX-MRT-16-12N               | 1                       | 3/4                      | 90.6  | 49.0 | 19.1 | 15.8 | 35.0     | 38.0     | 41.6 | 78.4  | 36.8 |
| IXX-MRT-16-16N               | 1                       | 1                        | 95.5  | 49.0 | 23.8 | 22.3 | 35.0     | 38.0     | 46.5 | 83.3  | 36.8 |
| IXX-MRT-20-20N               | 1-1/4                   | 1-1/4                    | 114.1 | 66.5 | 23.8 | 27.6 | 46.0     | 50.0     | 47.6 | 92.1  | 44.5 |
| IXX-MRT-24-24N               | 1-1/2                   | 1-1/2                    | 138.4 | 78.0 | 26.2 | 34.0 | 55.0     | 57.0     | 60.4 | 111.2 | 50.8 |

## (METRIC OD Tubes X Male NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A     | Ax   | B    | ØE   | F<br>A/F | G<br>A/F | Hy   | H     | Hx   |
|------------------------------|-------------------------|--------------------------|-------|------|------|------|----------|----------|------|-------|------|
|                              | T<br>Tube<br>OD<br>(mm) | P<br>NPT<br>Male<br>(in) |       |      |      |      |          |          |      |       |      |
| (mm)                         |                         |                          |       |      |      |      |          |          |      |       |      |
| IXX-MRT-3M-2N                | 3                       | 1/8                      | 41.4  | 23.6 | 9.6  | 2.4  | 11.0     | 11.0     | 17.8 | 34.8  | 17.0 |
| IXX-MRT-3M-4N                | 3                       | 1/4                      | 48.0  | 24.6 | 14.3 | 2.4  | 14.0     | 11.0     | 23.4 | 41.4  | 18.0 |
| IXX-MRT-6M-2N                | 6                       | 1/8                      | 45.8  | 27.0 | 9.6  | 4.8  | 14.0     | 14.0     | 18.8 | 38.9  | 19.6 |
| IXX-MRT-6M-4N                | 6                       | 1/4                      | 50.4  | 27.0 | 14.3 | 4.8  | 14.0     | 14.0     | 23.4 | 43.0  | 19.6 |
| IXX-MRT-6M-6N                | 6                       | 3/8                      | 56.0  | 29.8 | 14.3 | 4.8  | 19.0     | 14.0     | 26.2 | 48.6  | 22.4 |
| IXX-MRT-8M-4N                | 8                       | 1/4                      | 53.2  | 28.8 | 14.3 | 6.3  | 14.0     | 16.0     | 24.4 | 45.7  | 21.3 |
| IXX-MRT-8M-6N                | 8                       | 3/8                      | 56.8  | 30.6 | 14.3 | 6.3  | 19.0     | 16.0     | 26.2 | 49.3  | 23.1 |
| IXX-MRT-8M-8N                | 8                       | 1/2                      | 65.6  | 32.6 | 19.1 | 6.3  | 22.0     | 16.0     | 33.0 | 58.1  | 25.1 |
| IXX-MRT-10M-4N               | 10                      | 1/4                      | 57.7  | 31.5 | 14.3 | 7.1  | 17.0     | 19.0     | 26.2 | 50.1  | 23.9 |
| IXX-MRT-10M-6N               | 10                      | 3/8                      | 57.7  | 31.5 | 14.3 | 7.9  | 19.0     | 19.0     | 26.2 | 50.1  | 23.9 |
| IXX-MRT-10M-8N               | 10                      | 1/2                      | 66.5  | 33.5 | 19.1 | 7.9  | 22.0     | 19.0     | 33.0 | 58.9  | 25.9 |
| IXX-MRT-12M-4N               | 12                      | 1/4                      | 62.2  | 36.0 | 14.3 | 7.1  | 22.0     | 22.0     | 26.2 | 52.1  | 25.9 |
| IXX-MRT-12M-6N               | 12                      | 3/8                      | 62.2  | 36.0 | 14.3 | 9.5  | 22.0     | 22.0     | 28.2 | 52.1  | 25.9 |
| IXX-MRT-12M-8N               | 12                      | 1/2                      | 69.0  | 36.0 | 19.1 | 9.5  | 22.0     | 22.0     | 33.0 | 58.9  | 25.9 |
| IXX-MRT-16M-8N               | 16                      | 1/2                      | 73.1  | 38.0 | 19.1 | 11.9 | 24.0     | 25.0     | 35.1 | 64.0  | 27.9 |
| IXX-MRT-25M-12N              | 25                      | 3/4                      | 90.8  | 49.1 | 19.1 | 15.8 | 35.0     | 38.0     | 41.7 | 78.5  | 36.8 |
| IXX-MRT-25M-16N              | 25                      | 1                        | 95.6  | 49.1 | 23.8 | 21.8 | 35.0     | 38.0     | 46.5 | 83.3  | 36.8 |
| IXX-MRT-30M-20N              | 30                      | 1-1/4                    | 120.0 | 66.9 | 23.8 | 26.2 | 45.0     | 50.0     | 53.1 | 101.4 | 48.3 |
| IXX-MRT-32M-20N              | 32                      | 1-1/4                    | 125.4 | 72.3 | 23.8 | 27.6 | 45.0     | 50.0     | 53.1 | 102.4 | 49.3 |
| IXX-MRT-38M-24N              | 38                      | 1-1/2                    | 144.4 | 84.0 | 26.2 | 33.7 | 55.0     | 57.0     | 60.4 | 116.8 | 56.4 |



# MALE BRANCH TEE



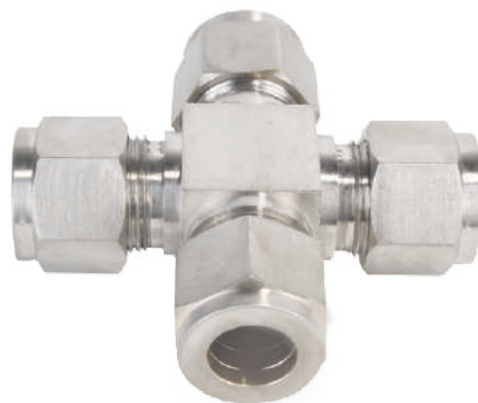
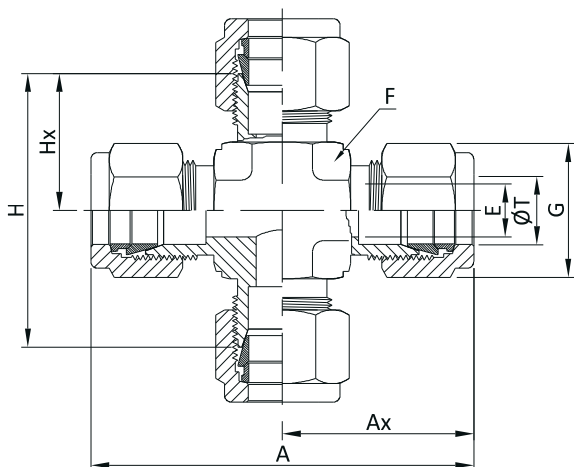
## (INCH OD Tubes x Male NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A     | B    | ØE   | F<br>A/F | G<br>A/F | Hy   | H     |
|------------------------------|-------------------------|--------------------------|-------|------|------|----------|----------|------|-------|
|                              | T<br>Tube<br>OD<br>(in) | P<br>NPT<br>Male<br>(in) |       |      |      |          |          |      |       |
| IXX-MBT-2-2N                 | 1/8                     | 1/8                      | 47.2  | 9.6  | 2.4  | 11.0     | 11.0     | 17.8 | 34.0  |
| IXX-MBT-2-4N                 | 1/8                     | 1/4                      | 49.2  | 14.3 | 2.4  | 14.0     | 11.0     | 23.4 | 36.0  |
| IXX-MBT-4-2N                 | 1/4                     | 1/8                      | 53.8  | 9.6  | 4.8  | 14.0     | 14.0     | 18.8 | 39.2  |
| IXX-MBT-4-4N                 | 1/4                     | 1/4                      | 53.8  | 14.3 | 4.8  | 14.0     | 14.0     | 23.4 | 39.2  |
| IXX-MBT-4-6N                 | 1/4                     | 3/8                      | 59.4  | 14.3 | 4.8  | 19.0     | 14.0     | 26.2 | 44.8  |
| IXX-MBT-4-8N                 | 1/4                     | 1/2                      | 63.6  | 19.1 | 4.8  | 22.0     | 14.0     | 33.0 | 44.8  |
| IXX-MBT-6-4N                 | 3/8                     | 1/4                      | 61.0  | 14.3 | 7.1  | 17.0     | 17.0     | 25.4 | 46.2  |
| IXX-MBT-6-6N                 | 3/8                     | 3/8                      | 62.4  | 14.3 | 7.1  | 19.0     | 17.0     | 26.2 | 47.8  |
| IXX-MBT-6-8N                 | 3/8                     | 1/2                      | 66.0  | 19.1 | 7.1  | 22.0     | 17.0     | 33.0 | 51.8  |
| IXX-MBT-8-4N                 | 1/2                     | 1/4                      | 72.0  | 14.3 | 4.8  | 22.0     | 22.0     | 28.2 | 51.8  |
| IXX-MBT-8-6N                 | 1/2                     | 3/8                      | 72.0  | 14.3 | 9.6  | 22.0     | 22.0     | 28.2 | 51.8  |
| IXX-MBT-8-8N                 | 1/2                     | 1/2                      | 72.0  | 19.1 | 10.4 | 22.0     | 22.0     | 33.0 | 51.8  |
| IXX-MBT-10-8N                | 5/8                     | 1/2                      | 76.2  | 19.1 | 11.9 | 22.0     | 25.0     | 35.0 | 55.8  |
| IXX-MBT-12-8N                | 3/4                     | 1/2                      | 79.8  | 19.1 | 11.9 | 27.0     | 29.0     | 36.8 | 59.4  |
| IXX-MBT-12-12N               | 3/4                     | 3/4                      | 79.8  | 19.1 | 15.8 | 27.0     | 29.0     | 36.8 | 59.4  |
| IXX-MBT-16-12N               | 1                       | 3/4                      | 98.0  | 19.1 | 15.8 | 35.0     | 38.0     | 41.6 | 73.6  |
| IXX-MBT-16-16N               | 1                       | 1                        | 98.0  | 23.8 | 22.3 | 35.0     | 38.0     | 46.5 | 73.6  |
| IXX-MBT-20-20N               | 1-1/4                   | 1-1/4                    | 133.0 | 23.8 | 27.6 | 46.0     | 50.0     | 47.6 | 89.0  |
| IXX-MBT-24-24N               | 1-1/2                   | 1-1/2                    | 156.0 | 26.2 | 34.0 | 55.0     | 57.0     | 60.4 | 101.6 |

## (METRIC OD Tubes x Male NPT)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               |                          | A     | B    | ØE   | F<br>A/F | G<br>A/F | Hy   | H     |
|------------------------------|-------------------------|--------------------------|-------|------|------|----------|----------|------|-------|
|                              | T<br>Tube<br>OD<br>(mm) | P<br>NPT<br>Male<br>(in) |       |      |      |          |          |      |       |
| IXX-MBT-3M-2N                | 3                       | 1/8                      | 47.2  | 9.6  | 2.4  | 11.0     | 11.0     | 17.8 | 34.0  |
| IXX-MBT-3M-4N                | 3                       | 1/4                      | 49.2  | 14.3 | 2.4  | 14.0     | 11.0     | 23.4 | 36.0  |
| IXX-MBT-6M-2N                | 6                       | 1/8                      | 54.0  | 9.6  | 4.8  | 14.0     | 14.0     | 18.8 | 39.2  |
| IXX-MBT-6M-4N                | 6                       | 1/4                      | 54.0  | 14.3 | 4.8  | 14.0     | 14.0     | 23.4 | 39.2  |
| IXX-MBT-6M-6N                | 6                       | 3/8                      | 59.6  | 14.3 | 4.8  | 19.0     | 14.0     | 26.2 | 44.8  |
| IXX-MBT-8M-4N                | 8                       | 1/4                      | 57.6  | 14.3 | 6.3  | 14.0     | 16.0     | 24.4 | 42.6  |
| IXX-MBT-8M-6N                | 8                       | 3/8                      | 61.2  | 14.3 | 6.3  | 19.0     | 16.0     | 26.2 | 46.2  |
| IXX-MBT-8M-8N                | 8                       | 1/2                      | 65.2  | 19.1 | 6.3  | 22.0     | 16.0     | 33.0 | 50.2  |
| IXX-MBT-10M-4N               | 10                      | 1/4                      | 63.0  | 14.3 | 7.1  | 17.0     | 19.0     | 26.2 | 47.8  |
| IXX-MBT-10M-6N               | 10                      | 3/8                      | 63.0  | 14.3 | 7.9  | 19.0     | 19.0     | 26.2 | 47.8  |
| IXX-MBT-10M-8N               | 10                      | 1/2                      | 67.0  | 19.1 | 7.9  | 22.0     | 19.0     | 33.0 | 51.8  |
| IXX-MBT-12M-4N               | 12                      | 1/4                      | 72.0  | 14.3 | 7.1  | 22.0     | 22.0     | 26.2 | 51.8  |
| IXX-MBT-12M-6N               | 12                      | 3/8                      | 72.0  | 14.3 | 9.5  | 22.0     | 22.0     | 28.2 | 51.8  |
| IXX-MBT-12M-8N               | 12                      | 1/2                      | 72.0  | 19.1 | 9.5  | 22.0     | 22.0     | 33.0 | 51.8  |
| IXX-MBT-16M-8N               | 16                      | 1/2                      | 76.0  | 19.1 | 11.9 | 24.0     | 25.0     | 35.1 | 55.8  |
| IXX-MBT-25M-12N              | 25                      | 3/4                      | 98.2  | 19.1 | 15.8 | 35.0     | 38.0     | 41.7 | 73.6  |
| IXX-MBT-25M-16N              | 25                      | 1                        | 98.2  | 23.8 | 21.8 | 35.0     | 38.0     | 46.5 | 73.6  |
| IXX-MBT-30M-20N              | 30                      | 1-1/4                    | 139.8 | 23.8 | 26.2 | 45.0     | 50.0     | 53.1 | 96.6  |
| IXX-MBT-32M-20N              | 32                      | 1-1/4                    | 144.6 | 23.8 | 27.6 | 45.0     | 50.0     | 53.1 | 98.6  |
| IXX-MBT-38M-24N              | 38                      | 1-1/2                    | 168.0 | 26.2 | 33.7 | 55.0     | 57.0     | 60.4 | 112.8 |

# UNION CROSS



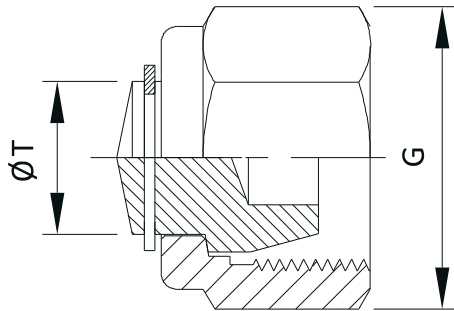
## (INCH OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               | A    | Ax   | ØE   | F<br>A/F | G<br>A/F | H    | Hx   |
|------------------------------|-------------------------|------|------|------|----------|----------|------|------|
|                              | T<br>Tube<br>OD<br>(in) |      |      |      |          |          |      |      |
|                              |                         | (mm) |      |      |          |          |      |      |
| IXX-UC-2                     | 1/8                     | 44.8 | 22.4 | 2.4  | 11.0     | 11.0     | 31.6 | 15.8 |
| IXX-UC-4                     | 1/4                     | 53.8 | 26.9 | 4.8  | 14.0     | 14.0     | 39.2 | 19.6 |
| IXX-UC-6                     | 3/8                     | 61.0 | 30.5 | 7.1  | 17.0     | 17.0     | 46.4 | 23.2 |
| IXX-UC-8                     | 1/2                     | 72.0 | 36.0 | 10.4 | 22.0     | 22.0     | 51.8 | 25.9 |
| IXX-UC-12                    | 3/4                     | 79.8 | 39.9 | 15.8 | 27.0     | 28.5     | 59.4 | 29.7 |
| IXX-UC-16                    | 1                       | 98.0 | 49.0 | 22.3 | 35.0     | 38.0     | 73.6 | 36.8 |

## (METRIC OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               | A    | Ax   | ØE   | F<br>A/F | G<br>A/F | H    | Hx   |
|------------------------------|-------------------------|------|------|------|----------|----------|------|------|
|                              | T<br>Tube<br>OD<br>(mm) |      |      |      |          |          |      |      |
|                              |                         | (mm) |      |      |          |          |      |      |
| IXX-UC-3M                    | 3                       | 44.6 | 22.3 | 2.4  | 11.0     | 11.0     | 31.4 | 15.7 |
| IXX-UC-6M                    | 6                       | 54.0 | 27.0 | 4.8  | 14.0     | 14.0     | 39.2 | 19.6 |
| IXX-UC-8M                    | 8                       | 57.6 | 28.8 | 6.3  | 16.0     | 16.0     | 42.6 | 21.3 |
| IXX-UC-10M                   | 10                      | 63.0 | 31.5 | 7.9  | 17.0     | 19.0     | 47.8 | 23.9 |
| IXX-UC-12M                   | 12                      | 72.0 | 36.0 | 9.5  | 22.0     | 22.0     | 51.8 | 25.9 |
| IXX-UC-16M                   | 16                      | 76.0 | 38.0 | 12.7 | 24.0     | 25.0     | 55.8 | 27.9 |
| IXX-UC-22M                   | 22                      | 89.2 | 44.6 | 18.3 | 32.0     | 32.0     | 69.0 | 34.5 |
| IXX-UC-25M                   | 25                      | 98.2 | 49.1 | 21.8 | 35.0     | 38.0     | 73.6 | 36.8 |

# TUBE PLUG



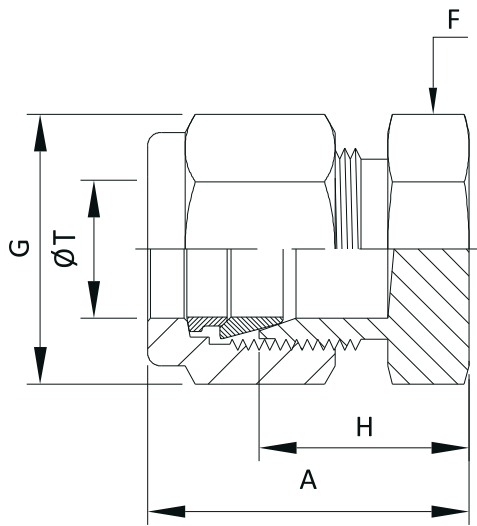
## (INCH OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.            | G<br>A/F |
|------------------------------|----------------------|----------|
|                              | T<br>Tube<br>OD (in) | (in)     |
| IXX-TP-1                     | 1/16                 | 8.0      |
| IXX-TP-2                     | 1/8                  | 11.0     |
| IXX-TP-4                     | 1/4                  | 14.0     |
| IXX-TP-5                     | 5/16                 | 16.0     |
| IXX-TP-6                     | 3/8                  | 17.0     |
| IXX-TP-8                     | 1/2                  | 22.0     |
| IXX-TP-10                    | 5/8                  | 25.0     |
| IXX-TP-12                    | 3/4                  | 28.5     |
| IXX-TP-14                    | 7/8                  | 32.0     |
| IXX-TP-16                    | 1                    | 38.0     |
| IXX-TP-20                    | 1-1/4                | 50.0     |
| IXX-TP-24                    | 1-1/2                | 57.0     |
| IXX-TP-32                    | 2                    | 76.0     |

## (METRIC OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.            | G<br>A/F |
|------------------------------|----------------------|----------|
|                              | T<br>Tube<br>OD (mm) | (in)     |
| IXX-TP-3M                    | 3                    | 11.0     |
| IXX-TP-6M                    | 6                    | 14.0     |
| IXX-TP-8M                    | 8                    | 16.0     |
| IXX-TP-10M                   | 10                   | 19.0     |
| IXX-TP-12M                   | 12                   | 22.0     |
| IXX-TP-14M                   | 14                   | 25.0     |
| IXX-TP-15M                   | 15                   | 25.0     |
| IXX-TP-16M                   | 16                   | 25.0     |
| IXX-TP-18M                   | 18                   | 30.0     |
| IXX-TP-20M                   | 20                   | 32.0     |
| IXX-TP-22M                   | 22                   | 32.0     |
| IXX-TP-25M                   | 25                   | 38.0     |
| IXX-TP-28M                   | 28                   | 46.0     |
| IXX-TP-30M                   | 30                   | 50.0     |
| IXX-TP-32M                   | 32                   | 50.0     |
| IXX-TP-38M                   | 38                   | 57.0     |

# TUBE CAP



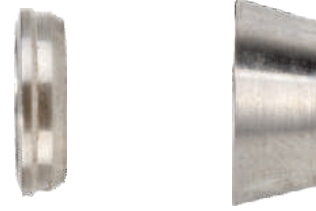
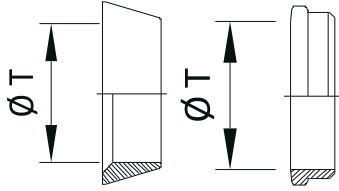
## (INCH OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               | A    | F<br>A/F | G<br>A/F | H    |
|------------------------------|-------------------------|------|----------|----------|------|
|                              | T<br>Tube<br>OD<br>(in) |      |          |          |      |
|                              |                         | (mm) |          |          |      |
| IXX-TC-1                     | 1/16                    | 13.0 | 11.0     | 8.0      | 11.2 |
| IXX-TC-2                     | 1/8                     | 20.0 | 11.0     | 11.0     | 13.5 |
| IXX-TC-4                     | 1/4                     | 23.4 | 14.0     | 14.0     | 16.0 |
| IXX-TC-5                     | 5/16                    | 24.4 | 16.0     | 16.0     | 17.0 |
| IXX-TC-6                     | 3/8                     | 25.7 | 17.0     | 17.0     | 18.3 |
| IXX-TC-8                     | 1/2                     | 29.2 | 22.0     | 22.0     | 19.0 |
| IXX-TC-10                    | 5/8                     | 30.0 | 24.0     | 25.0     | 19.8 |
| IXX-TC-12                    | 3/4                     | 31.5 | 27.0     | 28.5     | 21.4 |
| IXX-TC-14                    | 7/8                     | 34.0 | 35.0     | 32.0     | 23.9 |
| IXX-TC-16                    | 1                       | 38.4 | 35.0     | 38.0     | 26.2 |
| IXX-TC-20                    | 1-1/4                   | 53.3 | 46.0     | 50.0     | 31.2 |
| IXX-TC-24                    | 1-1/2                   | 64.5 | 55.0     | 57.0     | 37.4 |
| IXX-TC-32                    | 2                       | 88.6 | 70.0     | 76.0     | 49.3 |

## (METRIC OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.               | A    | F<br>A/F | G<br>A/F | H    |
|------------------------------|-------------------------|------|----------|----------|------|
|                              | T<br>Tube<br>OD<br>(mm) |      |          |          |      |
|                              |                         | (mm) |          |          |      |
| IXX-TC-3M                    | 3                       | 20.1 | 11.0     | 11.0     | 13.5 |
| IXX-TC-6M                    | 6                       | 23.1 | 14.0     | 14.0     | 15.7 |
| IXX-TC-8M                    | 8                       | 24.5 | 16.0     | 16.0     | 17.0 |
| IXX-TC-10M                   | 10                      | 26.6 | 17.0     | 19.0     | 19.0 |
| IXX-TC-12M                   | 12                      | 29.1 | 22.0     | 22.0     | 19.0 |
| IXX-TC-14M                   | 14                      | 29.9 | 24.0     | 25.0     | 19.8 |
| IXX-TC-15M                   | 15                      | 29.9 | 24.0     | 25.0     | 19.8 |
| IXX-TC-16M                   | 16                      | 29.9 | 24.0     | 25.0     | 19.8 |
| IXX-TC-18M                   | 18                      | 31.4 | 27.0     | 30.0     | 21.3 |
| IXX-TC-20M                   | 20                      | 34.0 | 32.0     | 32.0     | 23.9 |
| IXX-TC-22M                   | 22                      | 34.0 | 32.0     | 32.0     | 23.9 |
| IXX-TC-25M                   | 25                      | 38.5 | 35.0     | 38.0     | 26.2 |
| IXX-TC-28M                   | 28                      | 48.5 | 41.0     | 46.0     | 27.7 |
| IXX-TC-30M                   | 30                      | 53.4 | 46.0     | 50.0     | 31.8 |
| IXX-TC-32M                   | 32                      | 55.8 | 46.0     | 50.0     | 32.8 |
| IXX-TC-38M                   | 38                      | 65.4 | 55.0     | 57.0     | 37.8 |

# FERRULE



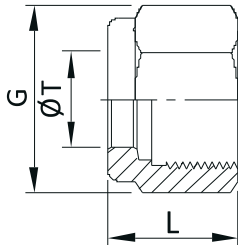
## (INCH OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.            |
|------------------------------|----------------------|
|                              | T<br>Tube<br>OD (in) |
| IXX-F-1                      | 1/16                 |
| IXX-F-2                      | 1/8                  |
| IXX-F-4                      | 1/4                  |
| IXX-F-5                      | 5/16                 |
| IXX-F-6                      | 3/8                  |
| IXX-F-8                      | 1/2                  |
| IXX-F-10                     | 5/8                  |
| IXX-F-12                     | 3/4                  |
| IXX-F-14                     | 7/8                  |
| IXX-F-16                     | 1                    |
| IXX-F-20                     | 1-1/4                |
| IXX-F-24                     | 1-1/2                |
| IXX-F-32                     | 2                    |

## (METRIC OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.            |
|------------------------------|----------------------|
|                              | T<br>Tube<br>OD (mm) |
| IXX-F-3M                     | 3                    |
| IXX-F-6M                     | 6                    |
| IXX-F-8M                     | 8                    |
| IXX-F-10M                    | 10                   |
| IXX-F-12M                    | 12                   |
| IXX-F-14M                    | 14                   |
| IXX-F-15M                    | 15                   |
| IXX-F-16M                    | 16                   |
| IXX-F-18M                    | 18                   |
| IXX-F-20M                    | 20                   |
| IXX-F-22M                    | 22                   |
| IXX-F-25M                    | 25                   |
| IXX-F-28M                    | 28                   |
| IXX-F-30M                    | 30                   |
| IXX-F-32M                    | 32                   |
| IXX-F-38M                    | 38                   |

# NUT



## (INCH OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.            | G    | L    |
|------------------------------|----------------------|------|------|
|                              | T<br>Tube<br>OD (in) |      |      |
| IXX-N-1                      | 1/16                 | 8.0  | 8.0  |
| IXX-N-2                      | 1/8                  | 11.0 | 12.0 |
| IXX-N-4                      | 1/4                  | 14.0 | 12.7 |
| IXX-N-5                      | 5/16                 | 16.0 | 14.0 |
| IXX-N-6                      | 3/8                  | 17.0 | 14.5 |
| IXX-N-8                      | 1/2                  | 22.0 | 17.5 |
| IXX-N-10                     | 5/8                  | 25.0 | 17.5 |
| IXX-N-12                     | 3/4                  | 28.5 | 17.5 |
| IXX-N-14                     | 7/8                  | 32.0 | 17.5 |
| IXX-N-16                     | 1                    | 38.0 | 20.6 |
| IXX-N-20                     | 1-1/4                | 50.0 | 31.8 |
| IXX-N-24                     | 1-1/2                | 57.0 | 38.0 |
| IXX-N-32                     | 2                    | 76.0 | 52.5 |

## (METRIC OD Tubes)

| Instrumxx<br>PRODUCT<br>CODE | End Conn.            | G    | L    |
|------------------------------|----------------------|------|------|
|                              | T<br>Tube<br>OD (mm) |      |      |
| IXX-N-3M                     | 3                    | 11.0 | 12.0 |
| IXX-N-6M                     | 6                    | 14.0 | 12.7 |
| IXX-N-8M                     | 8                    | 16.0 | 13.5 |
| IXX-N-10M                    | 10                   | 19.0 | 15.1 |
| IXX-N-12M                    | 12                   | 22.0 | 17.5 |
| IXX-N-14M                    | 14                   | 25.0 | 17.5 |
| IXX-N-15M                    | 15                   | 25.0 | 17.5 |
| IXX-N-16M                    | 16                   | 25.0 | 17.5 |
| IXX-N-18M                    | 18                   | 30.0 | 17.5 |
| IXX-N-20M                    | 20                   | 32.0 | 17.5 |
| IXX-N-22M                    | 22                   | 32.0 | 17.5 |
| IXX-N-25M                    | 25                   | 38.0 | 20.6 |
| IXX-N-28M                    | 28                   | 46.0 | 30.6 |
| IXX-N-30M                    | 30                   | 50.0 | 32.7 |
| IXX-N-32M                    | 32                   | 50.0 | 31.8 |
| IXX-N-38M                    | 38                   | 57.0 | 38.1 |





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